



Roto AL Designo

Concealed hardware for aesthetic aluminium windows
and balcony doors

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1 General information

1.1 Version history

Ver- sion	Date	Changes
v0	31/03/2015	Summary of all folded installation plans
v1	26/08/2015	
v2	02/11/2017	
v3	27/03/2018	
v4	31/01/2021	<p>IMO restructured:</p> <ul style="list-style-type: none">■ Division according to opening types removed and moved to the “Hardware overviews”, “Installation”, “Installation drawings” and “Adjustment” chapters.■ “Large packaging for individual components” and “Large packaging for sets” chapters added.■ Torques standardised. <p>New content:</p> <ul style="list-style-type: none">■ SH application ranges up to 3000 mm (where possible)■ T&T hardware overview TiltSafe RC 2 150 kg <p>Hardware overviews changed:</p> <ul style="list-style-type: none">■ Standardised classification according to basic set, espagnolette and connector, height-dependent components, width-dependent components, weight-dependent components, optional■ Required order quantity () <p>Installation changed:</p> <p>Application diagrams and installation drawings added and changed.</p> <p>Table of minimum sash widths and heights changed.</p> <p>Space requirement for hardware changed.</p> <p>Contents of T connector set changed (espagnolette support must be ordered separately).</p> <p>Packaging units changed.</p> <p>Connecting rod fixed dimensions changed.</p> <p>Installation added and changed.</p>

Ver- sion	Date	Changes
v5	31/08/2022	<p>Application diagrams changed.</p> <p>Floating mullion application ranges changed → <i>from page 132</i>.</p> <p>Bullet-catch set changed → <i>from page 174</i>.</p> <p>Installation drawings of TiSt and floating mullion changed.</p> <p>Installation of bullet-catch set changed → <i>from page 241</i>.</p> <p>Accessories: turn lock set, Jet black matt (R06.2) added. → <i>from page 172</i></p> <p>Installation of anti-lifting device added → <i>from page 235</i>.</p> <p>Installation drawings of floating mullion changed → <i>from page 132</i>.</p> <p>Installation drawing of FM, couplable SEC lock RC 2 / RC 3 DIN R added → <i>from page 288</i>.</p> <p>Installation drawing of bullet-catch set added → <i>from page 293</i>.</p> <p>Adjustment of CL frame component (T-O) added.</p>
v6	06/11/2024	<p>TiltSafe moved to SUG_56.</p> <p>Max. opening angle added → <i>from page 26</i>.</p> <p>Reference in the application diagram to durability test from S.kg > 150 kg added → <i>from page 28</i>.</p> <p>Material number of sash stay 390 changed.</p> <p>Material number of turn restrictor set with stop changed → <i>from page 44</i>.</p> <p>Hardware overviews for RC 3 – figure of RC 3 SEC cams changed.</p> <p>T-O hardware overview RC 3 180 kg: pivot rest and corner hinge set in parts list changed → <i>from page 116</i>.</p> <p>Hardware overview of FM-Su espagnolette set and shootbolt rod changed → <i>from page 134</i>.</p> <p>Accessories for turn restrictor set with stop added → <i>from page 171</i>.</p> <p>Test of corner hinge mounting added → <i>from page 204</i>.</p> <p>Installation of FM-Su espagnolette changed → <i>from page 231</i>.</p> <p>Description added to turn restrictor, "Insert all sash components before installing the corner hinge" → <i>from page 243</i>.</p> <p>FM-Su installation drawing changed → <i>from page 284</i>.</p> <p>FM-R installation drawing changed → <i>from page 286</i>.</p> <p>Adjustment of Turn-Only hardware: note on lateral adjustment for corner and rebate stay hinge with CL set added → <i>from page 301</i>.</p>

1.2 Instructions

This manual contains important information, instructions, application diagrams (max. sash sizes and weights) and assembly instructions for the installation, maintenance and operation of hardware.

The information and instructions contained in this document refer to products belonging to the Roto hardware system named on the front page.

All steps must be completed in sequence.

The following document applies in addition to these instructions:

- Handles catalogue: CTL_1
- ift guideline "Erstellung von Anwendungsdiagrammen für Dreh- und Drehkip-Beschläge" (Creating application diagrams for Turn-Only and Tilt&Turn hardware components)

The following guidelines also apply:

Gütegemeinschaft Schlösser und Beschläge e.V.

- Directive TBDK: Attachment of supporting fitting components for turn-only and tilt&turn fittings

- Directive VHBE: Hardware for windows and balcony doors – Guidelines/ advice for end-users
- Directive VHBH: Hardware for windows and balcony doors – Guidelines/ advice on the product and on liability

VFF (German Window and Facade Association)

- TLE.01: Correct handling of ready-to-install windows and external doors during transport, storage and installation
- WP.01: Maintenance of windows, facades and external doors – Maintenance, care and inspection – Information for sales
- WP.02: Maintenance of windows, facades and external doors – Maintenance, care and inspection – Measures and documents
- WP.03: Maintenance of windows, facades and external doors – Maintenance, care and inspection – Maintenance agreement

Additional guidelines

- Instructions and information issued by profile manufacturers, e.g. manufacturers of windows and balcony doors
- Instructions and information issued by screw manufacturers
- The applicable regulations, directives and national laws

Storing the instructions

These instructions are an important part of the product. The instructions must be stored so that they are always to hand.

Explanation of the markings

The manual uses the following markings for emphasis (e.g. in figures or instructions):

Marking	Meaning
	Optional / alternative components seated in the sash
	Sash / components seated in the sash
	Optional / alternative components seated in the frame
	Frame / components seated in the frame
	Drill holes, routing, screw positions
	Unaffected components / indirectly affected components
	Components, arrows or movements that have just been described
	Item number
[1]	Legend
[A]	Steps



INFO

Any dimensions without a unit in the instructions are given in millimetres (mm). Other units of measurement are clearly indicated by the presence of the differing unit.



INFO

Figures are provided in the right-hand version (DIN 107).

1.3 Symbols

Symbol	Meaning
■	First-level list
□	Second-level list
→	(Cross) reference
▷	Result
►	Unnumbered step
1.	Numbered step
a.	Numbered second-level step
⇒	Requirement

1.4 Pictographs

Symbol	Meaning
	Turn-Only
	Tilt&Turn / TiltFirst
	Tilt-Only
	Floating mullion with Turn-Only and Tilt&Turn
	Aluminium

1.5 Product features

Symbol	Meaning
#	Quantity
	Order quantity
	Description
	Width
	Colour
	Colour code, Roto
	Sash width
	Sash weight
	Sash height
	Size
	Height
	Information

Symbol	Meaning
	Tilt distance
	Clamping strip version
	Length
Nº	Material number
	Installation type
	Position
	Frame groove
[*]	Collective call-out
	Type of screws
	Packaging unit

1.6 Abbreviations

Abbreviation	Meaning
Fig.	Figure
AL	Aluminium
CTL	Catalogue
TR	Turn restrictor
TR size 1	with damped / braked turn restrictor size 1
TR size 2	with damped / braked turn restrictor size 2
T-O	Turn-Only hardware
DIN L / R	DIN left / right
T&T	Tilt&Turn hardware
FG	Flush-encased gearbox
CD	Corner drive
SW	Sash width
S.kg	Sash weight
SH	Sash height
HH	Handle height
ESP	Espagnolette
IMO	Installation instructions
incl.	including
ISR	Hexalobular socket
TiS	Tilt-Only hardware
TiSt	Tilt-Only hardware, handle at the top
TiSs	Tilt-Only hardware, handle at the side
kN	Kilonewtons
kg	Kilograms
compl.	complete
L	Left
M	Metric
m²	Square metres
Max.	Maximum
Min.	Minimum
mm	Millimetres
CL	Centre lock
Nm	Torque
Not sh.	Not shown
R	Right

Abbreviation	Meaning
FWi	Frame width, internal
RC	Resistance class
FHi	Frame height, internal
SP. COL.	Special colour
SEC	Security
FM	Floating-mullion espagnolette, internal
FM-Su	Floating-mullion espagnolette, surface-mounted
FM-SuN	Floating-mullion espagnolette, surface-mounted, narrow version
FM-Sh	Floating-mullion shootbolt
FM-R	Floating-mullion espagnolette, slider
T	Connecting rod designation e.g. T1 Screw driver profile hexalobular socket e.g. T10
TF	TiltFirst hardware
VB	Multi-ported striker

1.7 Target groups

The information in this document is directed at the following target groups:

Hardware dealers

The “hardware dealers” target group includes all companies and individuals that purchase hardware from hardware manufacturers for resale, without modifying or further processing the hardware.

Window and balcony door manufacturers

The “window and balcony door manufacturers” target group includes all companies and individuals that purchase hardware from hardware manufacturers or hardware dealers and further process the hardware by integrating it in windows and balcony doors.

Building element dealers or installation companies

The “building element dealers or installation companies” target group includes all companies and individuals that purchase windows and balcony doors from window and balcony door manufacturers for resale and for installation in construction projects, without modifying the windows or balcony doors.

Builders

The “builders” target group includes all companies and individuals who place orders for the manufacture of windows and balcony doors for installation in their construction projects.

End users

The “end users” target group includes all individuals who use the installed windows and balcony doors.

1.8 Target groups’ obligation to give instructions



INFO

Each target group must fulfil their obligation to give instructions in full.

Unless specified otherwise in the text below, documents and information can be passed on as a printed document, on a data storage device or via the Internet.

Responsibility of hardware dealers

Hardware dealers must pass the following documents on to the window and balcony door manufacturer:

- Catalogue
- Installation, maintenance and operation instructions
- Directive on attachment of supporting fitting components for turn-only and tilt&turn fittings (TBDK)
- Guidelines/advice on the product and on liability (VHBH)
- Guidelines/advice for end-users (VHBE)

Responsibility of the window and balcony door manufacturer

The window and balcony door manufacturer must pass the following documents on to building element dealers or the builder, even if a subcontractor (installation company) is involved:

- Installation, maintenance and operation instructions
- Directive on attachment of supporting fitting components for turn-only and tilt&turn fittings (TBDK)
- Guidelines/advice on the product and on liability (VHBH)
- Guidelines/advice for end-users (VHBE)

They must ensure that the end users are provided with the documents and information intended for them in printed format.

Responsibility of building element dealers and the installation company

Building element dealers must pass the following documents on to the builder, even if a subcontractor (installation company) is involved:

- Installation, maintenance and operation instructions (with a focus on hardware)
- Guidelines/advice on the product and on liability (VHBH)
- Guidelines/advice for end-users (VHBE)

Responsibility of the builder

The builder must pass the following documents on to the end user:

- Installation, maintenance and operation instructions (with a focus on hardware)
- Guidelines/advice for end-users (VHBE)

1.9 Copyright protection

The contents of this document are copyright-protected. This content can be used when working with the hardware. Any other use is not permitted without written permission of the manufacturer.

1.10 Limitation of liability

All information and instructions contained in this document have been compiled in consideration of the applicable standards and regulations, the latest developments in technology and many years of knowledge and experience.

The hardware manufacturer assumes no liability for damage caused by:

- Failure to comply with this document and all product-specific documents and other applicable directives (see the chapters entitled "Security" and "Stipulated use").
- Improper use / misuse (see the chapters entitled "Security" and "Stipulated use").
- Insufficient invitation to tender, non-compliance with installation specifications and non-compliance with the application diagrams (where available).
- Increased contamination.

Claims made by third parties against the hardware manufacturer on account of damage resulting from misuse or failure to comply with the obligation to give instructions on the part of hardware dealers, window, door and balcony door manufacturers and building element dealers or the builder are passed on accordingly.

The obligations agreed in the delivery contract, the general terms and conditions, the hardware manufacturer's terms and conditions of delivery and the legal provisions applicable when the contract was concluded shall apply.

The warranty only covers original Roto components.

We reserve the right to make technical changes as part of improvement to performance characteristics and further development.

1.11 Preserving the surface finish



ATTENTION

Surface treatments may cause property damage.

Surface treatments (e.g. painting and varnishing) on elements can damage components or prevent them from working properly.

- ▶ For masking, only use adhesive tape that does not damage the paint coats. Consult the manufacturer if in doubt.
- ▶ Protect components against direct contact with the surface treatment.
- ▶ Protect components against contamination.



ATTENTION

Using incorrect cleaning agents and sealing compounds may cause property damage.

Cleaning agents and sealing compounds may damage the surfaces of components and gaskets.

- ▶ Do not use aggressive or flammable liquids, acidic cleaners or abrasive cleaners.
- ▶ Only use mild, pH-neutral cleaning agents that have been diluted.
- ▶ Apply a thin protective film to the components, for example using a cloth soaked in oil.
- ▶ Avoid aggressive vapours (e.g. produced by formic acid, acetic acid, ammonia, amine compounds, ammonia compounds, aldehyde, carbolic acid, chlorine, tannic acid) around the element.
- ▶ Do not use any acetic acid-crosslinking or acid-crosslinking sealing compounds or those with the aforementioned constituents as both direct contact with the sealing compound and its fumes can corrode the surface of the components.



ATTENTION

Contamination may cause property damage.

Contamination prevents components working properly.

- ▶ Remove deposits and contamination caused by construction materials (e.g. plaster, gypsum).
- ▶ Keep components free of deposits and contaminants.



ATTENTION

(Permanently) damp room air may cause property damage.

Damp room air can lead to mould growth and corrosion caused by condensation.

- ▶ Provide adequate ventilation for components, particularly during the construction phase.
- ▶ Intensively air out the room several times per day by opening all elements for approximately 15 minutes. If intensive airing is not an option, place the elements in the tilt position and provide airtight masking inside the room, e.g. if there is fresh screed that cannot be walked on or must not be exposed to draughts. Discharge any humidity present in the room air to the outside using condensation dryers.
- ▶ Establish a ventilation plan for more complex construction projects if necessary.
- ▶ Provide adequate ventilation during holiday periods as well.

2 Security

This manual contains instructions relating to safety. The principal safety information in this chapter includes information and instructions relevant to the safe use or maintaining the safe condition of the product. Warning instructions that relate to handling warn of residual risks and are located before steps that are relevant to safety.

- Follow all of the instructions in order to prevent personal injury and property and environmental damage.

2.1 Presentation and structure of warning instructions

The warning instructions relate to individual actions and are structured as follows with a warning symbol:



DANGER

Nature and source of the danger.

Explanation and description of the danger and the implications.

- Measures to take to avert the danger.

2.2 Security levels of warning instructions

The warning instructions that relate to handling are identified differently according to the severity of the associated danger. The signal words and the associated warning symbols used are clarified below.



DANGER

Immediate risk of death or serious injuries.

- Observe these warning instructions to avoid personal injuries.



WARNING

Potential risk of death or serious injuries.

- Observe these warning instructions to avoid personal injuries.



CAUTION

Risk of injuries

- Observe these warning instructions to avoid personal injuries.



ATTENTION

Reference to property or environmental damage.

- Observe these warning instructions to avoid property or environmental damage.

2.3 Stipulated use

Turn-Only and Tilt&Turn hardware components are one-hand operation, Turn-Only and Tilt&Turn hardware components for windows and balcony doors in structural engineering. This hardware is used to move window sashes and balcony door sashes to a turned position by actuating a hand lever or a tilt position which is restricted by the scissor stay version. Turn-Only and Tilt&Turn hardware components may be used on vertically installed windows and balcony doors made of timber, PVC, aluminium or steel, or corresponding combinations of the aforementioned materials. Turn-Only and Tilt&Turn hardware components in the sense of this definition close windows and bal-



cony door sashes or move them into various ventilation positions. During the closing process, the gasket counter force must generally be overcome.

Stipulated use also includes compliance with all safety information and specifications contained in these instructions, the other applicable documents and the applicable regulations, directives and national laws.

2.3.1 Misuse

Any use and processing of the products that goes beyond or differs from the stipulated use is considered misuse and can lead to hazardous situations.



WARNING

Misuse may pose a risk of death!

Misuse and incorrect installation of hardware can lead to serious injuries.

- ▶ Only use hardware combinations that have been approved by the hardware manufacturer.
- ▶ Only use original accessories or those that have been approved by the hardware manufacturer.
- ▶ Note the product-related documentation → *from page 11*.

2.3.2 Usage restriction

Opened sashes in windows and balcony doors, and windows and balcony door sashes that are unlocked or placed in ventilation positions, only have a shielding effect. They do not meet the following requirements:

- Joint sealing
- Driving rain impermeability
- Sound insulation
- Thermal insulation
- Burglary inhibition



INFO

Windows built with security strikers for tilt ventilation fulfil the burglary inhibition function in the tilt position.

2.4 Stipulated use for end users

For windows or balcony doors with Turn-Only or Tilt&Turn hardware, windows or balcony door sashes can be moved to a turned position by operating a hand lever or to a tilt position restricted by the scissor stay version.

When closing a sash and locking the hardware, the gasket counter force must generally be overcome.



WARNING

Opening and closing sashes in an uncontrolled manner may pose a risk of death!

Opening and closing the sash in an uncontrolled manner may lead to serious injuries.

- ▶ Ensure that the sash does not collide with the frame, opening restrictor (buffer) or other sashes when it is moved into the fully open or closed position.
- ▶ Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.



ATTENTION

Opening and closing sashes in an uncontrolled manner may result in property damage.

Opening and closing the sash in an uncontrolled manner may cause the element to malfunction.

- ▶ Ensure that the sash does not collide with the frame, opening restrictor (buffer) or other sashes when it is moved into the fully open or closed position.
- ▶ Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.

Any use and processing of the products that goes beyond or differs from the stipulated use is considered misuse and can lead to hazardous situations.

No claims of any kind can be made on account of damage resulting from failure to comply with the stipulated use.

2.4.1 Misuse

Any use and processing of the products that goes beyond or differs from the stipulated use is considered misuse and can lead to hazardous situations.



WARNING

Misuse may pose a risk of death!

Misuse and incorrect installation of hardware can lead to serious injuries.

- ▶ Only use hardware combinations that have been approved by the hardware manufacturer.
- ▶ Only use original accessories or those that have been approved by the hardware manufacturer.
- ▶ Note the product-related documentation → *from page 11*.

2.5 Basic safety information

The following hazards may arise when handling the product:

2.5.1 Installation

Incorrect installation poses an immediate risk of death or serious injuries.

Incorrect installation or assembly of hardware can lead to hazardous situations or property damage. Depending on the height of the fall, this can result in serious to life-threatening injuries and glass breakage.

- ▶ Only use hardware combinations that have been approved by the hardware manufacturer.
- ▶ Only use original accessories or those that have been approved by the hardware manufacturer.
- ▶ Always have installation performed by a specialist company.

Heavy loads pose a risk of injury.

Lifting and carrying heavy loads may lead to injuries in the event of a fall or physical overexertion.

- ▶ Note the applicable accident prevention regulations.
- ▶ Transport heavy loads with two people and use suitable transportation means (such as an industrial truck).



Physical overexertion may be harmful to health.

Moving heavy loads for extended periods leads to physical injury in the long term.

- ▶ When carrying and lifting by hand, comply with a maximum weight of 25 kg for men and 10 kg for women.
- ▶ Carry and lift even smaller loads with an ergonomically correct posture.

2.5.2 Use

Falls from open windows and balcony doors present an immediate risk of death and pose the risk of serious injuries.

Opened sashes of windows and balcony doors create a danger zone. Depending on the height of the fall, this can result in serious to life-threatening injuries and glass breakage.

- ▶ Take care when in the vicinity of open windows and balcony doors.
- ▶ Keep children and anyone unable to understand the risks away from the hazardous area.

Trapping body parts in the opening between sash and frame may lead to serious injuries.

Gripping between the sash and frame when closing windows and balcony doors poses the risk of crushing injuries.

- ▶ When closing windows and balcony doors, never grip between the sash and frame and always exercise caution.
- ▶ Keep children and anyone unable to understand the risks away from the hazardous area.

Opening and closing sashes improperly poses the risk of injury and property damage.

Incorrect opening and closing of sashes can result in serious injuries and substantial property damage.

- ▶ When moving the sash, ensure that it will not slam against the frame or other sashes once fully opened or closed.
- ▶ Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.
- ▶ When closing a sash and locking the hardware, the gasket counter force must be overcome.

Misuse poses a risk of injury and property damage.

Misuse can lead to hazardous situations and may destroy the hardware, frame materials or other individual components within the windows or balcony doors.

- ▶ Do not introduce any obstacles in the opening area between the frame and window or balcony door sashes.
- ▶ Do not place additional loads on windows and balcony door sashes.
- ▶ Refrain from intentionally or uncontrollably slamming or pushing the window or balcony door sash against the window reveal or the opening restrictor.

Improper maintenance poses the potential risk of injury and property damage.

Windows and balcony doors, including the hardware, require expert maintenance (care, cleaning, maintenance and inspection) in order to guarantee their proper condition and safe use.

- ▶ Keep the hardware free of deposits and contaminants.
- ▶ Carry out care and cleaning tasks as specified in these instructions.
- ▶ Always have regular maintenance, adjustment and repair work carried out by a specialist company.

2.5.3 Ambient conditions

Physical and chemical influences may result in property damage.

Hardware components can be permanently damaged in a saline, aggressive or corrosive environment to the point that they can no longer function.

- ▶ Do not use the hardware components in a saline, aggressive or corrosive environment.
- ▶ Carry out care and cleaning tasks as specified in these instructions.
- ▶ Corrosion protection must be inspected by an authorised specialist company as part of regular maintenance work.

Moisture may cause property damage.

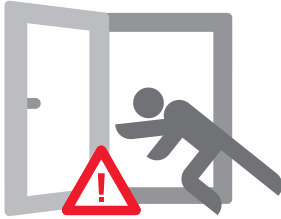
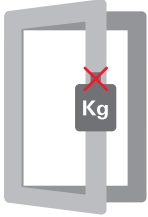
Depending on the outside temperature, relative humidity of the room air and installation situation of the windows and balcony doors, a temporary build-up of condensation may occur. This can lead to corrosion on the hardware and mould growth on the frame or wall. Ambient conditions that are too damp, particularly during the construction phase, can lead to timber elements warping.

- ▶ Avoid preventing the circulation of air (e.g. due to deep reveals, curtains and unfavourable positioning of radiators or the like).
- ▶ Intensively air out the room several times per day.
 Open all windows and balcony doors for approximately 15 minutes so that the air in the room can be completely replaced.
- ▶ Provide adequate ventilation during holiday periods as well.
- ▶ Create a ventilation plan for construction projects if necessary.

2.6 Operation

The safety symbols and markings and the associated warning instructions explained below apply to the safe operation of windows and balcony doors.

Safety symbols and markings

Symbol	Meaning
	<p>Falls from open windows and balcony doors present an immediate risk of death and pose the risk of serious injuries.</p> <p>Take care when in the vicinity of open windows and balcony doors.</p> <p>Keep children and anyone unable to understand the risks away from the hazardous area.</p>
	<p>Trapping body parts in the opening between sash and frame may lead to serious injuries.</p> <p>When closing windows and balcony doors, never grip between the sash and frame and always exercise caution.</p> <p>Keep children and anyone unable to understand the risks away from the hazardous area.</p>
	<p>Placing additional loads on the sash may lead to minor injuries and property damage.</p> <p>Avoid placing additional loads on the sash.</p>



Symbol	Meaning
	<p>The impact of wind may lead to minor injuries and property damage.</p> <p>Avoid exposing the open sash to wind.</p> <p>Close and lock the window and balcony door sash in windy or draughty conditions.</p>
	<p>Introducing obstacles into the opening between sash and frame may result in minor injuries and property damage.</p> <p>Avoid introducing obstacles into the opening between sash and frame.</p>
	<p>Pressing the sash against the edge of an opening (reveal) may pose a risk of minor injuries and cause property damage</p> <p>Refrain from pressing the sash against the edge of an opening (reveal).</p>

3 Information on the product

3.1 General hardware characteristics

- Hinge side / sash stay can be clamped in the frame groove using preassembled clamp strips with clamping blocks.
- Integrated piercing screw to prevent horizontal movement.
- Preassembled sash stay with integrated anti-slam device and lateral adjustment.
- Sash installation when tilted.
- Load transfer for sash weights > 100 kg (for T-O | 150 kg: > 80 kg).
- Centre locks can be placed at any position thanks to the insertable locking cams.
- Max. opening angle 100°, inward opening.
- Burglary inhibition up to RC 3 is possible (DIN EN 1627-1630).
- Corrosion resistance in accordance with DIN EN 1670: class 5 (480+1 h).
- Hardware certified in accordance with QM 328.

Components

- Geared-handle (window handles optionally lockable 100 Nm)
- Service handle with separate service handle (handle without escutcheon)
- Flush-encased gearbox with / without mishandling device (window handles optionally lockable 40 / 100 Nm)
- Handle without escutcheon for flush-encased gearbox (optionally lockable)
- Concealed floating-mullion sash hardware in the following versions:
 - Floating-mullion espagnolette, internal (FM)
 - Floating-mullion shootbolt (FM-Sh)
 - Floating-mullion espagnolette, surface-mounted (FM-Su)
 - Floating-mullion espagnolette, surface-mounted, narrow version (FM-SuN)
 - Floating-mullion espagnolette, slider (FM-R)
- Use of turn restrictor with stop SW ≥ 1200 mm
- Use of turn restrictor (damped, braked) SW ≥ 1200 mm
- Turn lock with cylinder lock, lockable
- Night vent
- Bullet catch

Adjustment

- The gasket compression can be adjusted by eccentric cams.
- Sash stay 390: lateral adjustment on the scissor stay rod (-1.5 mm).
- Sash stay 500 / 735: lateral adjustment on the scissor stay guide (± 2 mm).
- Lateral adjustment on the corner hinge when installed (-1 / +2 mm).
- Turn-Only sash with rebate sash stay and integrated lateral adjustment, passive concealed locks on the hinge side.
- Turn-Only sash with couplable rebate sash stay and integrated lateral adjustment for active locking points (in conjunction with CL corner drive) on the hinge side.
- Height adjustment on the corner hinge when installed (-0.5 / +2 mm).

3.2 Application ranges

- Overlap width 21.5 – 22 mm
- Rebate clearance 11.5 – 12 mm
- Hardware axis 10 mm
- Frame groove V.01 and V.02
- Operating range -20 °C to +50 °C

3.3 Application diagrams



INFO

For information on using and reading application diagrams, e.g. for interpolation (calculating missing intermediate values), see BRO_347 (Roto application diagrams).

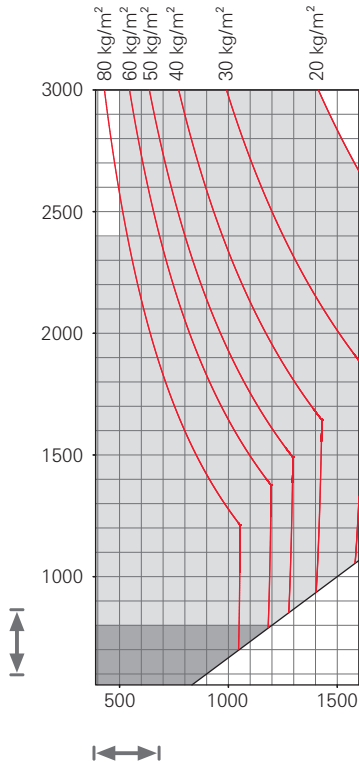
The values in the diagrams represent the large possible application range for the relevant opening type. Refer to the hardware overview for additional restrictions.



3.3.1 Tilt&Turn hardware

3.3.1.1 100 kg

Without load transfer



□ = Impermissible application range
■ With tilt depth restrictor $SH \leq 800$ mm

Test and calculation principles:

Hardware in accordance with EN 13126-8, class H3.

Additional loads in accordance with EN 14608 are not taken into consideration.

Requirements for using the application diagram:

Evidence on the attachment of load-bearing components to the window system by the window manufacturer in accordance with the TBDK table with the following forces:

- on the stay bearing with 2710 N
- on the pivot rest with 2890 N

Comply with the following values for all profile systems:

Deductible dimension of glass $C_G \geq 20$ mm

Profile weight $PW \leq 2.5$ kg/m

The specifications in the application diagram refer to the glass weight in kg/m^2 .

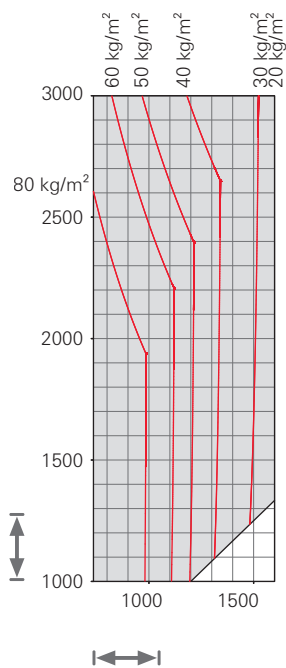
1 mm/m² glass thickness ≈ 2.5 kg

Glass weight max. 80 kg/m².

Application range		
	Sash width	390 – 1600 mm
	Sash height	555 – 3000 mm
	Sash weight	Max. 100 kg

3.3.1.2 150 kg

With load transfer



 = Impermissible application range

Test and calculation principles:

Hardware in accordance with EN 13126-8, class H3.

Additional loads in accordance with EN 14608 are not taken into consideration.

Requirements for using the application diagram:

Evidence on the attachment of load-bearing components to the window system by the window manufacturer in accordance with the TBDK table with the following forces:

- on the stay bearing with 4200 N
- on the pivot rest with 4340 N

Comply with the following values for all profile systems:

Deductible dimension of glass $C_G \geq 20$ mm

Profile weight $PW \leq 2.5$ kg/m

The specifications in the application diagram refer to the glass weight in kg/m^2 .

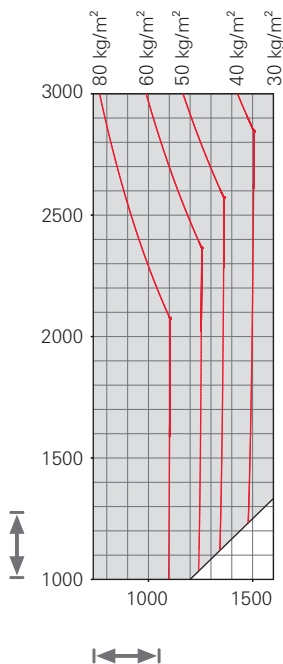
1 mm/m² glass thickness ≈ 2.5 kg

Glass weight max. 80 kg/m².

Application range		
	Sash width	735 – 1600 mm
	Sash height	1000 – 3000 mm
	Sash weight	Max. 150 kg

3.3.1.3 180 kg

With load transfer and turn restrictor



= Impermissible application range

Test and calculation principles:

Hardware in accordance with EN 13126-8, class H3.

Additional loads in accordance with EN 14608 are not taken into consideration.

Requirements for using the application diagram:

Evidence on the attachment of load-bearing components to the window system by the window manufacturer in accordance with the TBDK table with the following forces:

- on the stay bearing with 5000 N
- on the pivot rest with 5200 N

Comply with the following values for all profile systems:

Deductible dimension of glass $C_G \geq 20$ mm

Profile weight $PW \leq 2.5$ kg/m

S.kg > 150 kg:

Durability test in accordance with EN 1191 required.

The specifications in the application diagram refer to the glass weight in kg/m².

1 mm/m² glass thickness ≈ 2.5 kg

Glass weight max. 80 kg/m².

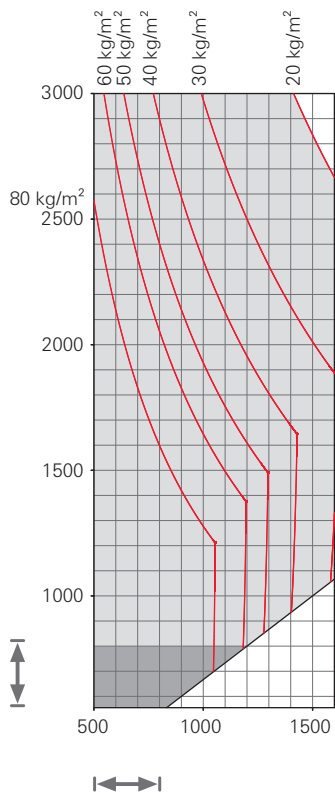
Application range		
	Sash width	735 – 1360 mm
	Sash height	1000 – 3000 mm
	Sash weight	Max. 180 kg

3.3.2 TiltFirst hardware / Tilt-Only hardware, handle at the side

3.3.2.1 100 kg

Without load transfer

With load transfer and turn restrictor



= Impermissible application range
 With tilt depth restrictor SH ≤ 800 mm

Test and calculation principles:
Hardware in accordance with EN 13126-8, class H3.
Additional loads in accordance with EN 14608 are not taken into consideration.

Requirements for using the application diagram:
Evidence on the attachment of load-bearing components to the window system by the window manufacturer in accordance with the TBDK table with the following forces:

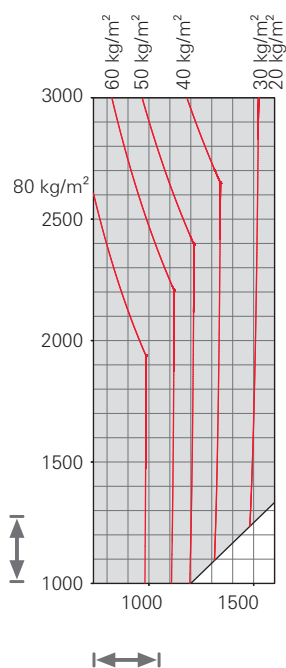
- on the stay bearing with 2710 N
- on the pivot rest with 2890 N

Comply with the following values for all profile systems:
Deductible dimension of glass C_G ≥ 20 mm
Profile weight PW ≤ 2.5 kg/m

The specifications in the application diagram refer to the glass weight in kg/m².
1 mm/m² glass thickness ≈ 2.5 kg
Glass weight max. 80 kg/m².

Application range		
	Sash width	500 – 1600 mm
	Sash height	555 – 3000 mm
	Sash weight	Max. 100 kg

3.3.2.2 150 kg
With load transfer



Impermissible application range

Test and calculation principles:

Hardware in accordance with EN 13126-8, class H3.

Additional loads in accordance with EN 14608 are not taken into consideration.

Requirements for using the application diagram:

Evidence on the attachment of load-bearing components to the window system by the window manufacturer in accordance with the TBDK table with the following forces:

- on the stay bearing with 4200 N
- on the pivot rest with 4340 N

Comply with the following values for all profile systems:

Deductible dimension of glass $C_G \geq 20$ mm

Profile weight $PW \leq 2.5$ kg/m

The specifications in the application diagram refer to the glass weight in kg/m².

1 mm/m² glass thickness ≈ 2.5 kg

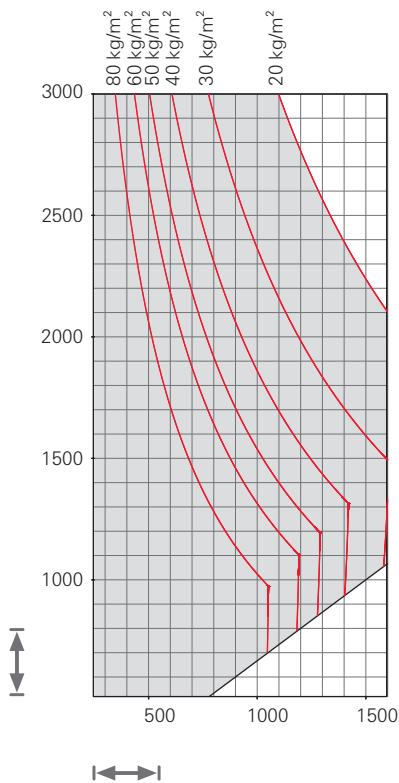
Glass weight max. 80 kg/m².

Application range		
	Sash width	735 – 1600 mm
	Sash height	1000 – 3000 mm
	Sash weight	Max. 150 kg

3.3.3 Turn-Only hardware

3.3.3.1 80 kg

Without load transfer



[Shaded area] = Impermissible application range

Test and calculation principles:

Hardware in accordance with EN 13126-8, class H3.
Additional loads in accordance with EN 14608 are not taken into consideration.

Requirements for using the application diagram:

Evidence on the attachment of load-bearing components to the window system by the window manufacturer in accordance with the TBDK table with the following forces:

- on the stay bearing with 2200 N
- on the pivot rest with 2310 N

Comply with the following values for all profile systems:

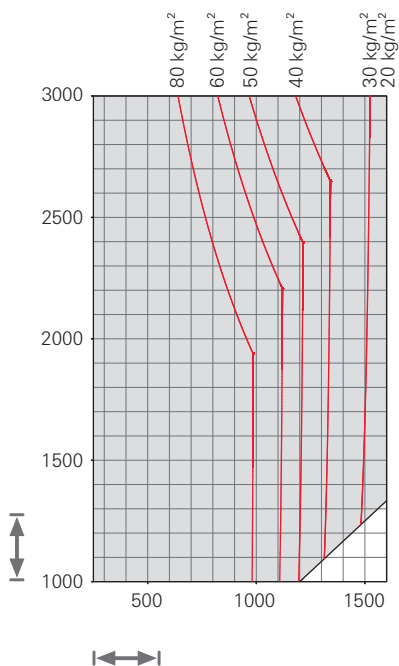
- Deductible dimension of glass CG ≥ 20 mm
- Profile weight PW ≤ 2.5 kg/m

The specifications in the application diagram refer to the glass weight in kg/m².
1 mm/m² glass thickness ≈ 2.5 kg
Glass weight max. 80 kg/m².

Application range		
[Sash width icon]	Sash width	250 – 1600 mm
[Sash height icon]	Sash height	520 – 3000 mm
[Sash weight icon]	Sash weight	Max. 80 kg

3.3.3.2 150 kg

With load transfer



= Impermissible application range

Test and calculation principles:

Hardware in accordance with EN 13126-8, class H3.

Additional loads in accordance with EN 14608 are not taken into consideration.

Requirements for using the application diagram:

Evidence on the attachment of load-bearing components to the window system by the window manufacturer in accordance with the TBDK table with the following forces:

- on the stay bearing with 4200 N
- on the pivot rest with 4340 N

Comply with the following values for all profile systems:

Deductible dimension of glass $C_G \geq 20$ mm

Profile weight $PW \leq 2.5$ kg/m

The specifications in the application diagram refer to the glass weight in kg/m².

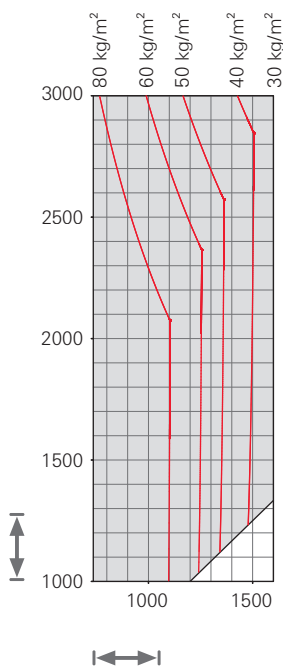
1 mm/m² glass thickness ≈ 2.5 kg

Glass weight max. 80 kg/m².

Application range		
	Sash width	250 – 1600 mm
	Sash height	1000 – 3000 mm
	Sash weight	Max. 150 kg

3.3.3.3 180 kg

With load transfer and turn restrictor



 = Impermissible application range

Test and calculation principles:

Hardware in accordance with EN 13126-8, class H3.

Additional loads in accordance with EN 14608 are not taken into consideration.

Requirements for using the application diagram:

Evidence on the attachment of load-bearing components to the window system by the window manufacturer in accordance with the TBDK table with the following forces:

- on the stay bearing with 5000 N
- on the pivot rest with 5200 N

Comply with the following values for all profile systems:

Deductible dimension of glass $C_G \geq 20$ mm

Profile weight $PW \leq 2.5$ kg/m

S.kg > 150 kg:

Durability test in accordance with EN 1191 required.

The specifications in the application diagram refer to the glass weight in kg/m².

1 mm/m² glass thickness ≈ 2.5 kg

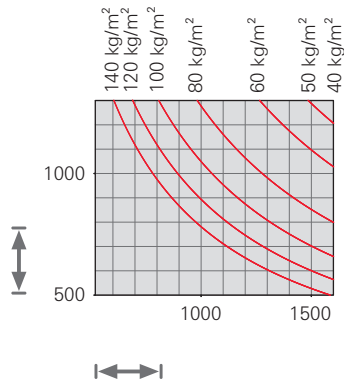
Glass weight max. 80 kg/m².

Application range		
	Sash width	735 – 1360 mm
	Sash height	1000 – 3000 mm
	Sash weight	Max. 180 kg



3.3.4 Tilt-Only hardware, handle at the top

3.3.4.1 100 kg



 = Impermissible application range

Test and calculation principles:

Hardware tested in accordance with EN 13126-8, class H3.

Comply with the following values for all profile systems:

Deductible dimension of glass $C_G \geq 20$ mm

Profile weight $PW \leq 2.5$ kg/m

The specifications in the application diagram refer to the glass weight in kg/m².

1 mm/m² glass thickness $\approx$ 2.5 kg

Glass weight max. 140 kg/m²

Application range		
	Sash width	520 – 1600 mm
	Sash height	500 – 1300 mm
	Sash weight	Max. 100 kg

3.4 Minimum sash widths and heights

Sash dimensions – standard

	Max. weight	Min. SW				Max. SW	Min. SH	Max. SH
		Without TR	TR with stop	TR size 1	TR size 2			
T&T								
Sash stay 390	80 kg	390	390	–	–	500	555	2400
Sash stay 500	100 kg	500	500	545	610	735	555	3000
Sash stay 735	100 kg	735	735	735	735	1600	555	3000
Sash stay 735	150 kg	735	735	735	735	1600	1000	3000
Sash stay 735	180 kg	–	735	735	800	1600	1000	3000
TF								
Sash stay 500	100 kg	500	500	645	715	735	555	3000
Sash stay 735	100 kg	735	735	735	735	1600	555	3000
Sash stay 735	150 kg	735	735	735	735	1600	1000	3000
T-O								
Rebate sash stay	80 kg	250	370	545	610	1600	520	3000
Rebate sash stay	150 kg	250	370	545	610	1600	1000	3000
T-O, couplable								
Rebate sash stay, couplable	80 kg	300	370	545	610	900	520	3000
Sash stay 500 – tilting disabled	80 kg	500	500	545	610	1600	520	3000
Sash stay 500 – tilting disabled	150 kg	500	500	545	610	1600	1000	3000
Sash stay 735 – tilting disabled	180 kg	–	735	735	800	1600	1000	3000
TiSt								
Rebate sash stay	100 kg	520	–	–	–	1600	500	1300

Information on the product
Minimum sash widths and heights

Max. weight		Min. SW				Max. SW	Min. SH	Max. SH
		Without TR	TR with stop	TR size 1	TR size 2			
TiSs								
Sash stay 500 – turning disabled	100 kg	500	–	–	–	735	555	3000
Sash stay 735 – turning disabled	100 kg	735	–	–	–	1600	555	3000
Sash stay 735 – turning disabled	150 kg	735	–	–	–	1600	1000	3000
Floating-mullion hardware (second opening sash)								
Sash stay 500 – tilting disabled	80 kg	710	710	710	710	1600	856	2700
Sash stay 500 – tilting disabled	150 kg	710	710	710	710	1600	1000	2700

Sash dimensions – RC 2

	Max. weight	Min. SW				Max. SW	Min. SH	Max. SH
		Without TR	TR with stop	TR size 1	TR size 2			
T&T								
Sash stay 500	100 kg	625	625	780	850	900	770	3000
Sash stay 735	100 kg	800	800	800	850	1600	770	3000
Sash stay 735	150 kg	800	800	800	850	1600	1000	3000
Sash stay 735	180 kg	–	800	945	1015	1600	1000	3000
TF								
Sash stay 500	100 kg	625	625	795	865	900	720	3000
Sash stay 735	100 kg	800	800	800	865	1600	720	3000
Sash stay 735	150 kg	800	800	800	865	1600	1000	3000
T-O								
Rebate sash stay	80 kg	530	620	795	865	1600	720	3000
Rebate sash stay	150 kg	530	620	795	865	1600	1000	3000
T-O, couplable								
Rebate sash stay, couplable	80 kg	370	600	775	845	900	720	3000
Sash stay 500 – tilting disabled	80 kg	625	625	780	850	1600	720	3000
Sash stay 500 – tilting disabled	150 kg	625	625	780	850	1600	1000	3000
Sash stay 735 – tilting disabled	180 kg	–	800	945	1015	1600	1000	3000
TiSt								
Rebate sash stay	100 kg	520	–	–	–	1600	500	1300
TiSs								
Sash stay 500 – turning disabled	100 kg	625	–	–	–	900	720	3000
Sash stay 735 – turning disabled	100 kg	800	–	–	–	1600	720	3000
Sash stay 735 – turning disabled	150 kg	800	–	–	–	1600	1000	3000
Floating-mullion hardware (second opening sash)								
Sash stay 500 – tilting disabled	80 kg	800	800	855	920	1600	856	2700
Sash stay 500 – tilting disabled	150 kg	800	800	855	920	1600	1000	2700

Sash dimensions – RC 3

	Max. weight	Min. SW				Max. SW	Min. SH	Max. SH
		Without TR	TR with stop	TR size 1	TR size 2			
T&T								
Sash stay 500	100 kg	700	795	–	–	900	870	3000
Sash stay 735	100 kg	875	875	970	1040	1600	870	3000
Sash stay 735	150 kg	875	875	970	1040	1600	1000	3000
Sash stay 735	180 kg	–	915	1045	1115	1600	1000	3000
TF								
Sash stay 500	100 kg	700	810	–	–	900	870	3000
Sash stay 735	100 kg	875	875	985	1055	1600	870	3000
Sash stay 735	150 kg	875	875	985	1055	1600	1000	3000
T-O								
Rebate sash stay	80 kg	680	810	985	1055	1600	1050	3000
Rebate sash stay	150 kg	680	810	985	1055	1600	1050	3000
T-O, couplable								
Rebate sash stay, couplable	80 kg	485	800	–	–	900	870	3000
Sash stay 500 – tilting disabled	80 kg	700	795	970	1040	1600	870	3000
Sash stay 500 – tilting disabled	150 kg	700	795	970	1040	1600	1000	3000
Sash stay 735 – tilting disabled	180 kg	–	915	1045	1115	1600	1000	3000



	Max. weight	Min. SW				Max. SW	Min. SH	Max. SH
		Without TR	TR with stop	TR size 1	TR size 2			
TiSt								
Rebate sash stay	100 kg	670	–	–	–	1600	500	1300
TiSs								
Sash stay 500 – turning disabled	100 kg	700	–	–	–	900	870	3000
Sash stay 735 – turning disabled	100 kg	875	–	–	–	1600	870	3000
Sash stay 735 – turning disabled	150 kg	875	–	–	–	1600	1000	3000
Floating-mullion hardware (second opening sash)								
Sash stay 500 – tilting disabled	80 kg	875	875	1045	1110	1600	870	2700
Sash stay 500 – tilting disabled	150 kg	875	875	1045	1110	1600	1000	2700

– Not permissible / not possible



INFO

Smaller sash widths are possible if the top and bottom security strikers are omitted.

Depending on the profile stability, the test can also be passed with fewer security locking points, and the structure can therefore have a smaller design.

For information about permissible handle heights, see the installation drawing of the striker positions → *from page 249*.

3.5 Profile cross sections

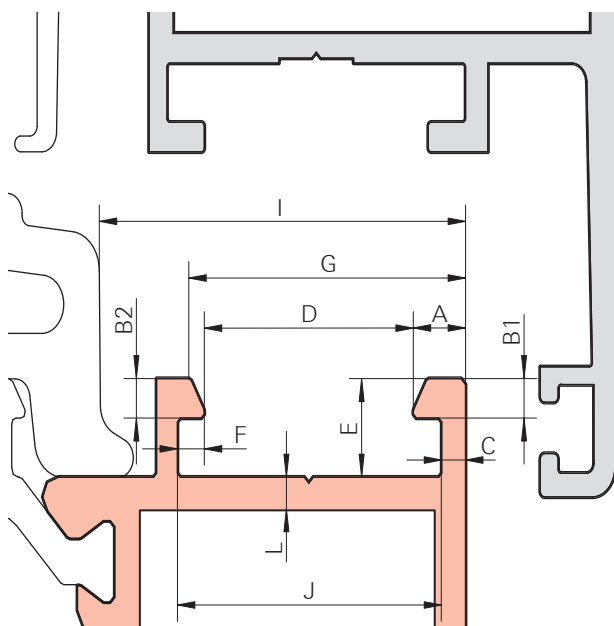


INFO

The following cross sections are neutral, schematic profile cross sections.

The hardware components listed in the table are profile-related and represent a selection from the Roto AL Designo product range for profiles with a 15 / 20 mm sash groove. Further hardware component solutions (e.g. for different groove widths) can be supplied upon request.

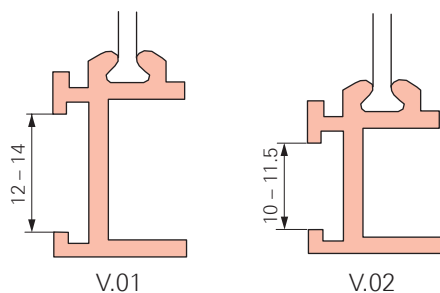
Roto can assist with the generally recommended profile assessments if you contact the Roto sales representative in charge of this.



Assignment	Meaning	Min.	Max.
[A]	Flange width, front	3.50	4.30
[B1]	Flange thickness, front	1.50	2.00
[B2]	Flange thickness, rear	1.50	2.00
[C]	Profile leg thickness, front	1.50	2.00
[D]	Groove width	10.00	14.00
[E]	Groove depth	4.50	5.20
[F]	Flange overhang, rear	1.70	2.50
[G]	Pivot rest supporting surface	13.20	18.50
[L]	Groove base thickness ^[1]	1.50	2.00
[I]	Frame installation space	22.00	–
[J]	Groove inside width	14.00	18.60

Groove versions

When ordering profile-related frame components, the descriptions V.01 and V.02 imperatively must be noted (see also → *from page 37*).



INFO

With groove versions from 11.6 mm to 11.9 mm, a profile assessment must be carried out and the components on the frame side must undergo demo assembly.

[1] Drilling jig for groove base thickness > 2 mm → *from page 153*



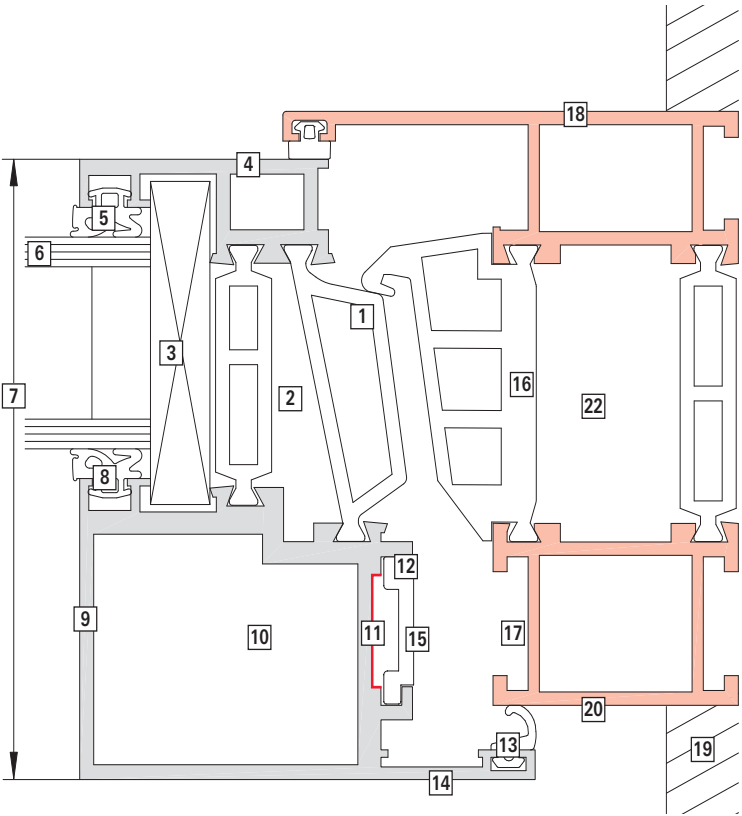
Clamp strip selection

Clamp strip version no. 1									
	Min.	Max.	DIN	Pivot rest	Sash stay 390	Sash stay 500	Sash stay 735	Rebate sash stay	Rebate sash stay set, couplable
C+J clamp strip dimension	16.00	17.10	L	624970	740851	624945	624947	627256	740843
			R	624969	740852	624944	624946	627255	740840

Clamp strip version no. 3									
	Min.	Max.	DIN	Pivot rest	Sash stay 390	Sash stay 500	Sash stay 735	Rebate sash stay	Rebate sash stay set, couplable
C+J clamp strip dimension	18.20	19.20	L	624972	740853	624951	624953	627258	740844
			R	624971	740854	624950	624952	627257	740841

Clamp strip version no. 4									
	Min.	Max.	DIN	Pivot rest	Sash stay 390	Sash stay 500	Sash stay 735	Rebate sash stay	Rebate sash stay set, couplable
C+J clamp strip dimension	19.30	20.50	L	624974	740855	624957	624959	627260	740845
			R	624973	740856	624956	624958	627259	740842

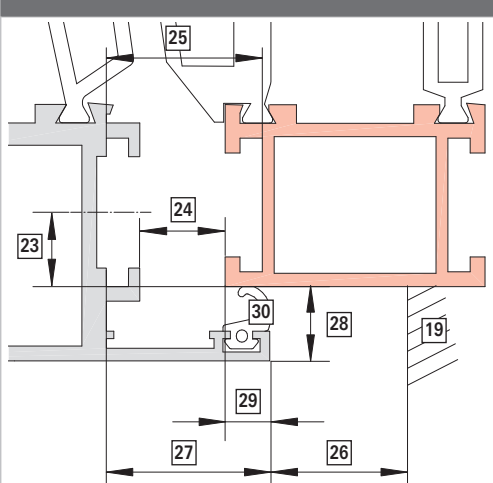
Descriptions on the sash and frame profile



Assignment	Meaning	Assignment	Meaning
[1]	Central gasket stop strut	[12]	Connecting rod groove
[2]	Thermal separation	[13]	Overlap gasket
[3]	Spacer blocking	[14]	Inside shell (sash)
[4]	Outer shell (sash)	[15]	Connecting rod
[5]	Glazing gasket, external	[16]	Central gasket
[6]	Glazing (laminated glass)	[17]	Frame clamping groove for hardware components (frame glazing bead groove)
[7]	Sash depth	[18]	Outer shell (frame)
[8]	Glazing gasket, internal	[19]	Internal reveal
[9]	Glazing bead	[20]	Inside shell (frame)

Assignment	Meaning	Assignment	Meaning
[10]	Sash glazing bead groove	[21]	Frame depth
[11]	Extended connecting rod groove (ECC-groove)	[22]	Thermal separation

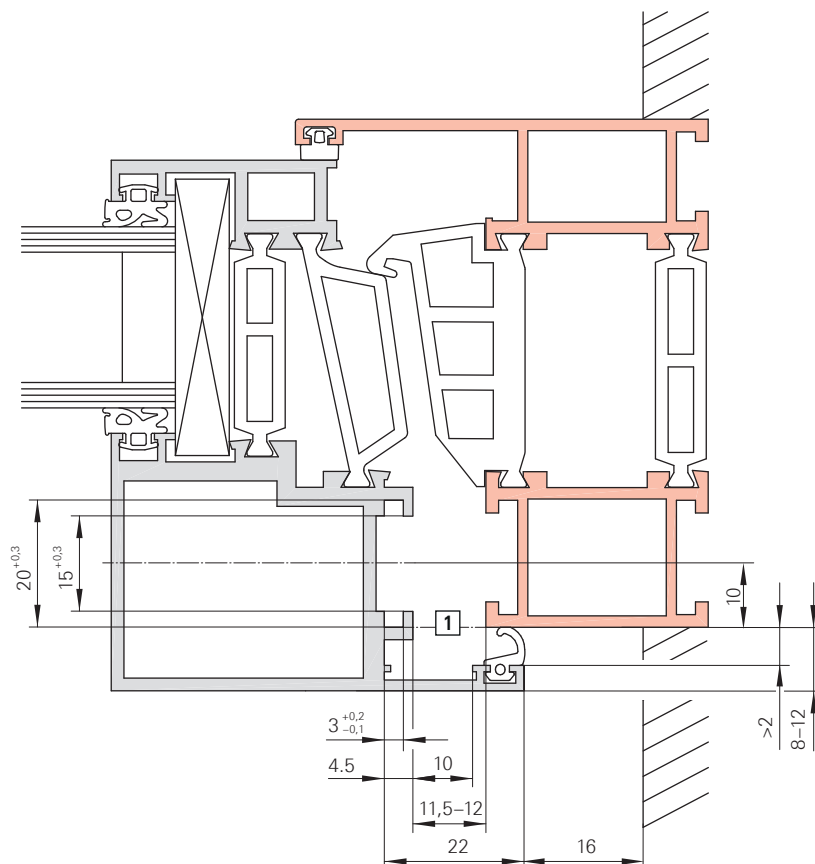
Dimensions

		Assignment	Meaning
		[23]	Hardware axis
		[24]	Rebate clearance
		[25]	Chamber dimension (hardware)
		[26]	Frame clearance
		[27]	Overlap width
		[28]	Overlap height (including gasket)
		[29]	Overlap coverage
		[30]	Hinge passage

3.6 Space requirement for hardware

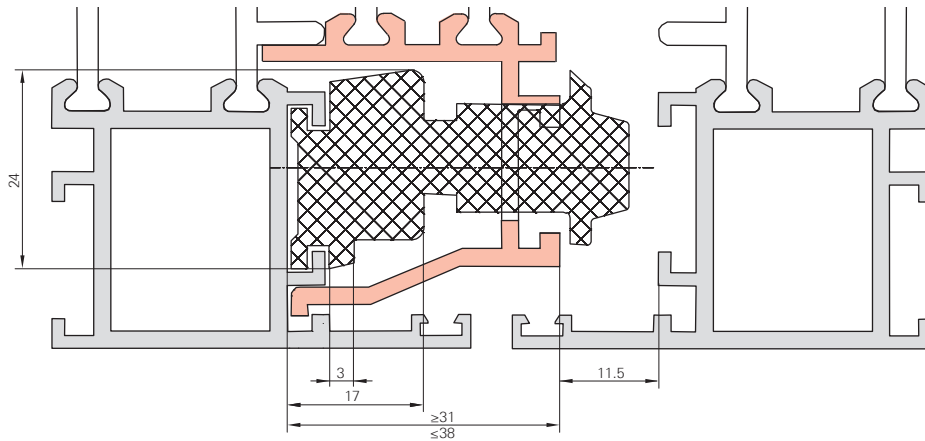
Please consult us in the event of deviating dimensions.

Single-sashed

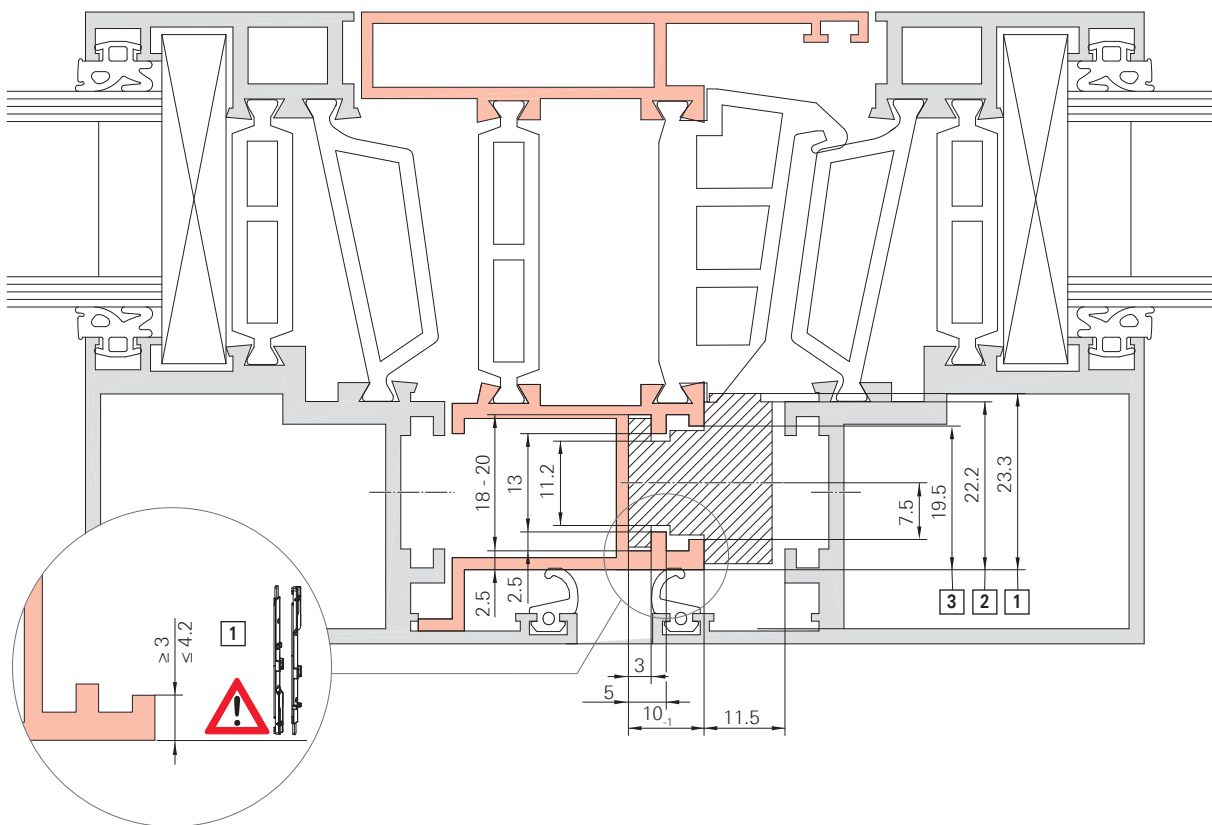


[1] Pay attention to the alignment of the sash and frame.

Double-sashed without fixed mullion – FM espagnolette type



Double-sashed without fixed mullion – FM-Su, FM-SuN, FM-R, FM-Sh espagnolette type



[1] Space requirement for FM-Sh

Note the additional information on the profile leg width (see detail drawing).

[2] Space requirement for FM-Su

[3] Space requirement for FM-R

4 Hardware overviews

The hardware overviews on the following pages are a recommendation on the part of Roto Frank Fenster- und Türtechnologie GmbH.

The basic page layout in the hardware overviews chapter firstly shows examples of the combination of individual hardware components, and the associated parts list can be seen on the following pages.

In the parts list, the parts that have to be ordered have a dark-grey background.

The required order quantity for an element can be found next to the shopping trolley symbol .

The packaging unit is in front of the material number. The minimum packaging quantity is ten units. Larger packaging units (e.g. 50 units) can be found under individual parts and accessories.

The item numbers in the squares link the hardware overview to the parts list.

Shown: DIN right version; size- and weight-dependent components are greyed out.

When installing a turn restrictor, note the changed minimum sash widths .

The actual hardware combination depends on:

- the width of the element
- the height of the element
- the weight of the element
- Resistance class



INFO

Resistance classes

- The RC 2 and RC 3 resistance classes refer to the entire system.
- The hardware complies with the corresponding resistance classes in the required system tests.
- However, the resistance classes are only complied with if all of the other components in the system (e.g. profile system, reinforcement, glass, etc.) are also designed for this.

Recommended handles can be found in the Roto Handles catalogue.

Determine the quantity of required hardware components with Roto Con Orders.



INFO

Roto Con Orders

Efficient online hardware configurator for the custom configuration of individual window and door hardware components. All conventional shapes and opening types can be automatically configured quickly and easily. Individual parts lists, including application ranges and an exemplary hardware overview, can be ordered from your responsible sales representative.

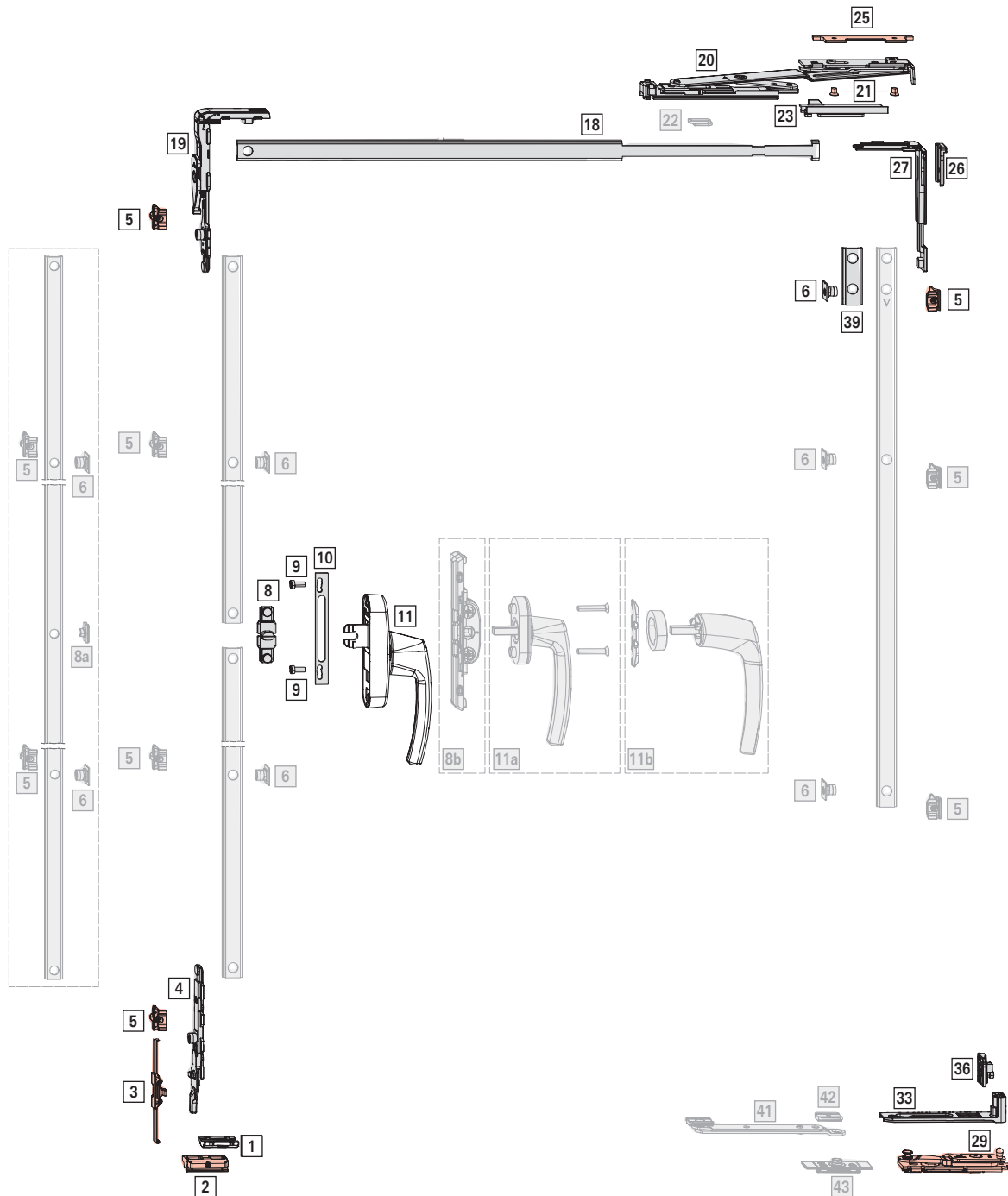


www.roto-frank.com



4.1 Tilt&Turn hardware

4.1.1 T&T | 80 kg





Application range

SW: 390 – 500 mm

SH: 555 – 2400 mm

S.kg: max. 80 kg



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest with clamp strip 			
			Nº
No. 1	Left	10 Piece(s)	624970
	Right	10 Piece(s)	624969
No. 3	Left	10 Piece(s)	624972
	Right	10 Piece(s)	624971
No. 4	Left	10 Piece(s)	624974
	Right	10 Piece(s)	624973

[*] Corner hinge set 			
		Nº	
Left	10 Piece(s)	739700	
Right	10 Piece(s)	739699	

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] T&T locking components set 			
Large packages → from page 158			
		Nº	
V.01	10 Piece(s)	728804	
V.02	10 Piece(s)	728805	

Contents:

[*]		#
[1]	Run-up block	1
[2]	Tilt striker	1
[3]	Anti-lifting device V.01 / V.02	1
[4]	Tilt lock bolt	1
[5]	Striker V.01 / V.02	2
[19]	Corner drive with blocking device and retaining fork	1

[*] Sash stay 390 				
				Nº
No. 1	150	Left	10 Piece(s)	740851
	150	Right	10 Piece(s)	740852
No. 3	150	Left	10 Piece(s)	740853
	150	Right	10 Piece(s)	740854

				Nº
No. 4	150	Left	10 Piece(s)	740855
	150	Right	10 Piece(s)	740856

Contents:

[*]		#
[18]	Coupling rod	1
[20]	Sash stay 390	1
[21]	Countersunk screw M5 x 7	2
[23]	Scissor stay inclusion	1
[25]	Clamp strip no. 1 / no. 3 / no. 4	1

[*] CL corner drive set 		
Large packages		
		Nº
V.01	20 Piece(s)	728842
V.02	20 Piece(s)	728843

Contents:

[*]		#
[5]	Striker V.01 / V.02	2
[6]	Cam, insertable	2
[26]	Retaining fork	1
[27]	CL corner drive	1

[39] Connecting rod, fixed, vertical (CR4) 	
→ from page 165	

Espagnolette and connector

[*] T connector set 			
Alternatively:			
[8a]	Connector bolt, insertable 	1	→ from page 162
[8b]	Flush-encased gearbox 	1	→ from page 163
		Nº	
AL T connector set	10 Piece(s)	728981	

Contents:

[*]		
[8]	T connector	1
[9]	Cylinder screw M5 x 12	2

[10] Espagnolette support 			
			Nº
Espagnolette support	For Roto Line AL geared-handle	13.5 100 Piece(s)	331937

[11] Roto Line window handle – geared-handle 			
→ CTL_1			
Alternatively:			
[a]	Roto Line window handle – standard	 1	→ CTL_1
	Countersunk screw M5 x 30	 2	
[b]	Roto Line window handle – handle without escutcheon	 1	→ CTL_1
	Ring for handle without escutcheon	 1	
	Mounting plate	 1	

Contents:

[*]		
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1

Height-dependent components

[5] Striker			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

	
≤ 1300	–
1301 – 1800	1
> 1801	3

[6] Cam, insertable			
		Nº	
Insertable	100 Piece(s)	334671	

	
≤ 1300	–
1301 – 1800	1
> 1801	3

[22] Tilt distance restrictor; SH ≤ 800 mm / reduce tilt distance 			
		Nº	
For sash stay 390	10 Piece(s)	639346	


INFO

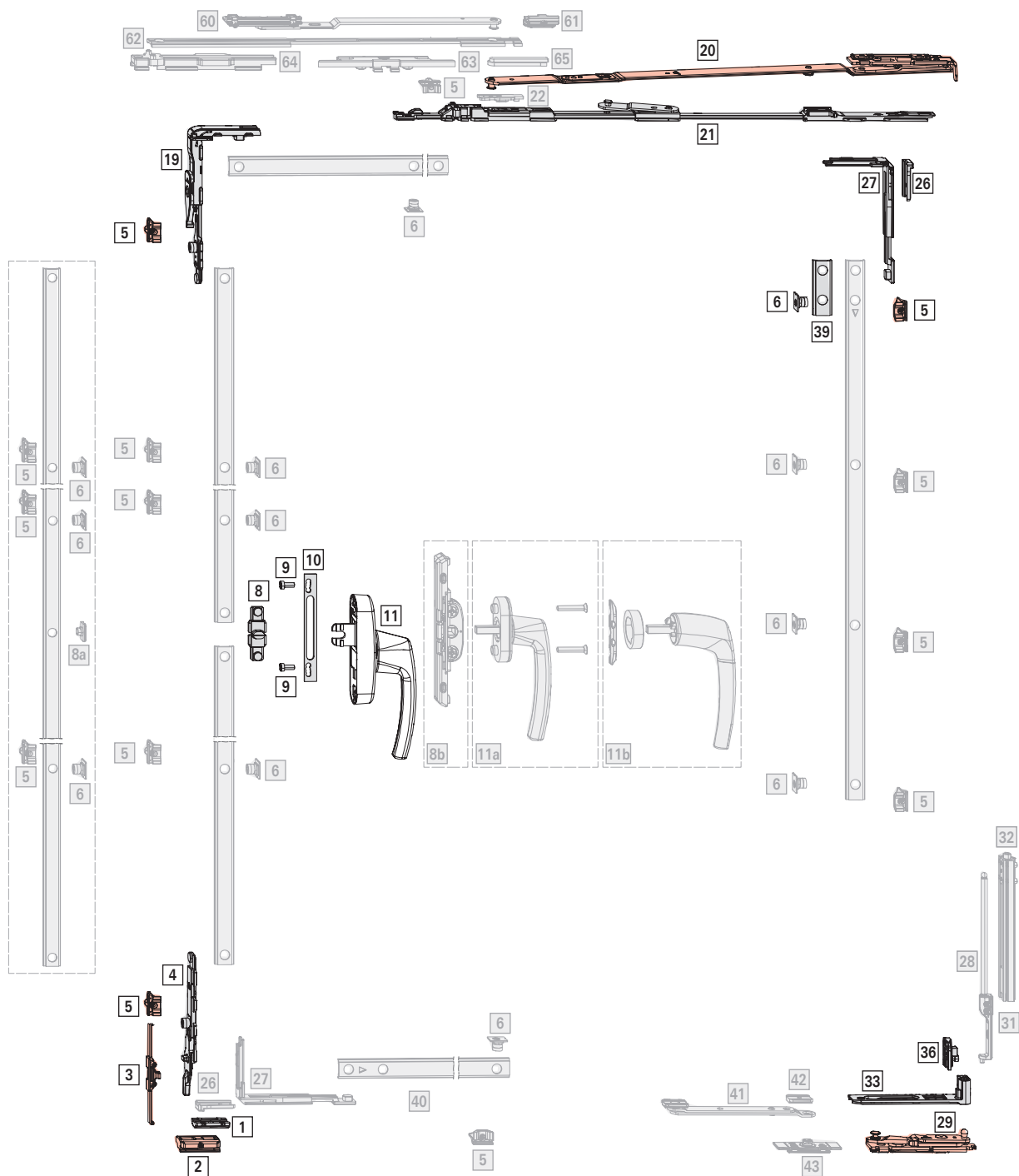
Using the tilt distance restrictor limits the tilt distance of the sash stay to 100 mm.

Optional

[*] Turn restrictor set, with stop 			
Alternatively:			
Turn restrictor set, braked, damped			
		 1	→ <i>from page 171</i>
			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613



4.1.2 T&T | 150 kg





Application range

SW: 500 – 1600 mm

SH: 555 – 3000 mm

S.kg: max. 150 kg



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest with clamp strip

				Nº
No. 1	Left	10 Piece(s)		624970
	Right	10 Piece(s)		624969
No. 3	Left	10 Piece(s)		624972
	Right	10 Piece(s)		624971
No. 4	Left	10 Piece(s)		624974
	Right	10 Piece(s)		624973

[*] Corner hinge set

			Nº
Left		10 Piece(s)	739700
Right		10 Piece(s)	739699

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] T&T locking components set Large packages → from page 158

			Nº
V.01		10 Piece(s)	728804
V.02		10 Piece(s)	728805

Contents:

[*]		#
[1]	Run-up block	1
[2]	Tilt striker	1
[3]	Anti-lifting device V.01 / V.02	1
[4]	Tilt lock bolt	1
[5]	Striker V.01 / V.02	2
[19]	Corner drive with blocking device and retaining fork	1

[21] Scissor stay guide

			Nº
500		10 Piece(s)	740836
735		10 Piece(s)	740838



	
≤ 735	500
> 735	735

[20] Sash stay

						Nº
500	No. 1	130	Left	10 Piece(s)		624945
		130	Right	10 Piece(s)		624944
	No. 3	130	Left	10 Piece(s)		624951
		130	Right	10 Piece(s)		624950
	No. 4	130	Left	10 Piece(s)		624957
		130	Right	10 Piece(s)		624956
735	No. 1	150	Left	10 Piece(s)		624947
		150	Right	10 Piece(s)		624946
	No. 3	150	Left	10 Piece(s)		624953
		150	Right	10 Piece(s)		624952
	No. 4	150	Left	10 Piece(s)		624959
		150	Right	10 Piece(s)		624958



	
≤ 735	500
> 735	735

[*] CL corner drive set Large packages

			Nº
V.01		20 Piece(s)	728842
V.02		20 Piece(s)	728843

Contents:

[*]		#
[5]	Striker V.01 / V.02	2
[6]	Cam, insertable	2
[26]	Retaining fork	1
[27]	CL corner drive	1

[39] Connecting rod, fixed, vertical (CR4) → from page 165

Espagnolette and connector

[*] T connector set Alternatively: [8a] Connector bolt, insertable 1 → from page 162

[8b] Flush-encased gearbox 1 → from page 163

		Nº
AL T connector set	10 Piece(s)	728981

Contents:

[*]		
[8]	T connector	1
[9]	Cylinder screw M5 x 12	2

[10] Espagnolette support

			Nº
Espagnolette support	For Roto Line AL geared-handle	13.5 100 Piece(s)	331937

[11] Roto Line window handle – geared-handle → CTL_1

Alternatively:

[a]	Roto Line window handle – standard	 1 → CTL_1
	Countersunk screw M5 x 30	 2
[b]	Roto Line window handle – handle without escutcheon	 1 → CTL_1
	Ring for handle without escutcheon	 1
	Mounting plate	 1

Height-dependent components

[5] Striker

			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

	
≤ 1300	–
1301 – 1800	1
1801 – 2400	3
> 2400	5

[6] Cam, insertable

		Nº
Insertable	100 Piece(s)	334671

	
≤ 1300	–
1301 – 1800	1
1801 – 2400	3
> 2400	5

[22] Tilt distance restrictor; SH ≤ 800 mm / reduce tilt distance

		Nº
For sash stay 500 / 735	10 Piece(s)	502834

INFO

Using the tilt distance restrictor limits the tilt distance of the sash stay to 100 mm.

Width-dependent components

[*] T&T additional stay arm set | 150 kg^[2]

			Nº
V.01	160	10 Piece(s)	728806
V.02	160	10 Piece(s)	728807

Contents:

[*]		#
[60]	Additional scissor stay arm, compl. V.01 / V.02	1
[61]	Retaining spring, compl.	1
[62]	Coupling rod	1
[63]	Scissor stay deadbolt	1
[64]	Scissor stay guide, compl. T&T	1
[65]	T&T stop	1

	
≤ 1300	–
> 1300	1

[*] CL corner drive set

Large packages

		Nº
V.01	20 Piece(s)	728842
V.02	20 Piece(s)	728843

Contents:

[*]		#
[5]	Striker V.01 / V.02	2
[6]	Cam, insertable	2
[26]	Retaining fork	1
[27]	CL corner drive	1

	
≤ 1300	–
> 1300	1

[*] Turn restrictor set, with stop

Alternatively:

[2] Installation of the mishandling device on the corner drive / flush-encased gearbox is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)).



Turn restrictor set, braked, damped 1 → *from page 171*

			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

[*]		
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1

	
≤ 1200	–
> 1200	1

[40] Connecting rod, fixed, horizontal, bottom (CR5)
→ *from page 165*

Weight-dependent components

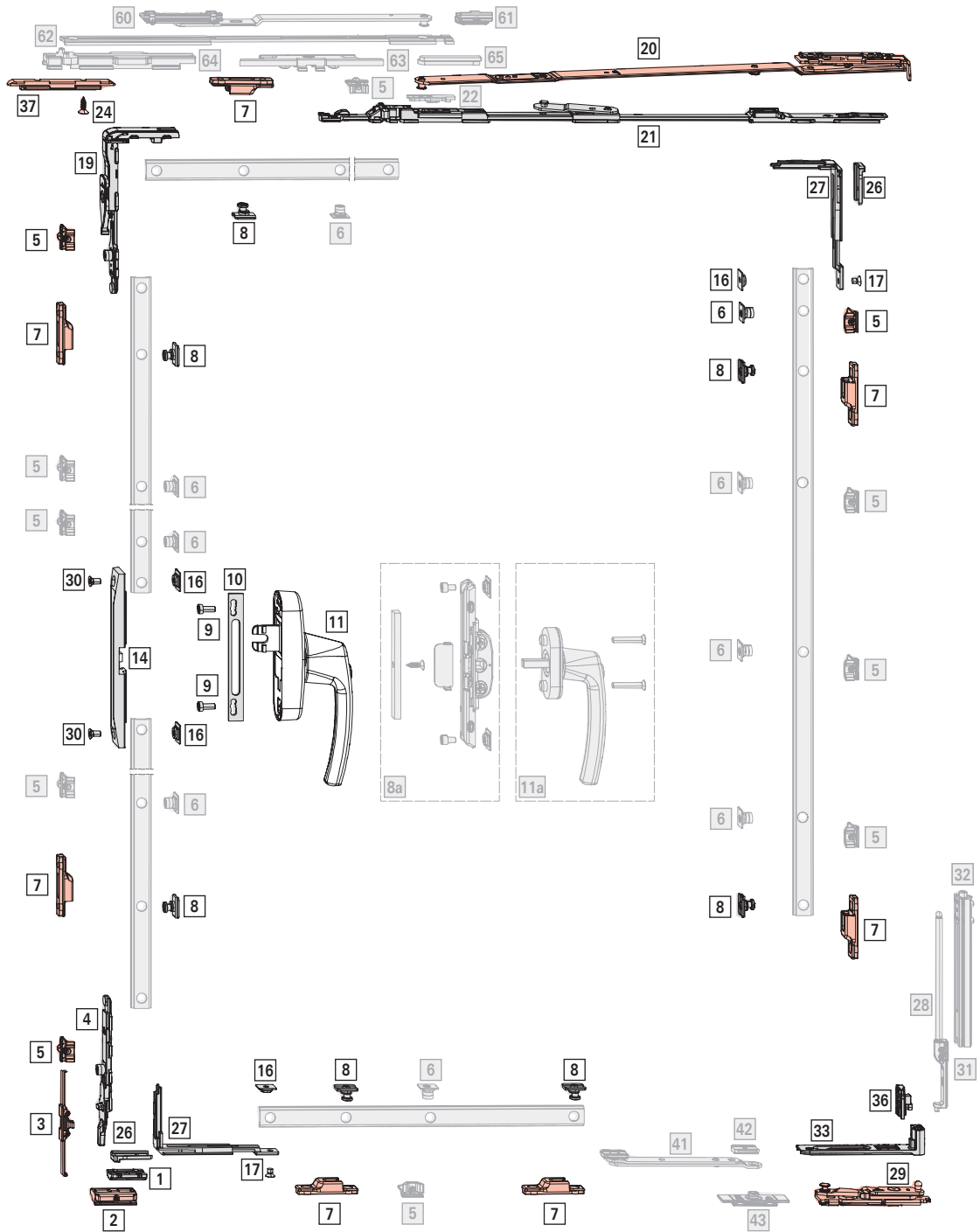
[*] Load transfer set; S.kg > 100 kg 1

			Nº
V.01	Left	10 Piece(s)	739694
	Right	10 Piece(s)	739693
V.02	Left	10 Piece(s)	739696
	Right	10 Piece(s)	739695

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1

4.1.3 T&T | RC 2 | 150 kg





Application range

SW: 625 – 1600 mm

SH: 770 – 3000 mm

S.kg: max. 150 kg



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest with clamp strip



			Nº
No. 1	Left	10 Piece(s)	624970
	Right	10 Piece(s)	624969
No. 3	Left	10 Piece(s)	624972
	Right	10 Piece(s)	624971
No. 4	Left	10 Piece(s)	624974
	Right	10 Piece(s)	624973

[*] Corner hinge set



		Nº
Left	10 Piece(s)	739700
Right	10 Piece(s)	739699

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] T&T locking components set



Large packages → from page 158

		Nº
V.01	10 Piece(s)	728804
V.02	10 Piece(s)	728805

Contents:

[*]		#
[1]	Run-up block	1
[2]	Tilt striker	1
[3]	Anti-lifting device V.01 / V.02	1
[4]	Tilt lock bolt	1
[5]	Striker V.01 / V.02	2
[19]	Corner drive with blocking device and retaining fork	1

[21] Scissor stay guide



		Nº
500	10 Piece(s)	740836
735	10 Piece(s)	740838



≤ 900	500
≥ 800	735

[20] Sash stay



					Nº
500	No. 1	130	Left	10 Piece(s)	624945
		130	Right	10 Piece(s)	624944
	No. 3	130	Left	10 Piece(s)	624951
		130	Right	10 Piece(s)	624950
	No. 4	130	Left	10 Piece(s)	624957
		130	Right	10 Piece(s)	624956
735	No. 1	150	Left	10 Piece(s)	624947
		150	Right	10 Piece(s)	624946
	No. 3	150	Left	10 Piece(s)	624953
		150	Right	10 Piece(s)	624952
	No. 4	150	Left	10 Piece(s)	624959
		150	Right	10 Piece(s)	624958



≤ 900	500
≥ 800	735

[*] CL SEC corner drive set



Large packages

		Nº
SEC corner drive CL set with retaining fork	10 Piece(s)	728944

[*]		#
[16]	SEC connector	1
[17]	Countersunk screw M5 x 7	1
[26]	SEC retaining fork	1
[27]	CL SEC corner drive	1

[*] SEC rebate-clearance reduction set



Large packages → from page 166

		Nº
SEC rebate-clearance reduction set	For corner drives 10 Piece(s)	728950

[*]		#
[24]	Countersunk screw ST4.8 x 16	1
[37]	SEC rebate-clearance reduction CD	1

[7] SEC striker

				Nº
V.01	9	100 Piece(s)		212637
V.02	9	100 Piece(s)		212638

[8] SEC cam RC 2

			Nº
Insertable		100 Piece(s)	447245

[5] Striker

				Nº
V.01	9	100 Piece(s)		728918
V.02	9	100 Piece(s)		728920

[6] Cam, insertable

			Nº
Insertable		100 Piece(s)	334671

Espagnolette and connector

[*] SEC espagnolette protection set

Large packages

Alternatively:

[8a] SEC flush-encased gearbox set  1 → from page 170

		Nº
SEC espagnolette protection set	10 Piece(s)	728952

Contents:

		#
[14] SEC espagnolette protection		1
[16] SEC connector		2
[30] Countersunk screw M5 x 10		2

[9] Cylinder screw M5 x 12

			Nº
Cylinder screw	M5x12	100 Piece(s)	728925

[10] Espagnolette support

				Nº
Espagnolette support	For Roto Line AL geared-handle	13.5	100 Piece(s)	331937

[11] Roto Line window handle – geared-handle, lockable

→ CTL_1

Alternatively:

[a] Roto Line window handle, lockable	 1	→ CTL_1
Countersunk screw M5 x 30	 2	

Height-dependent components

[5] Striker

				Nº
V.01	9	100 Piece(s)		728918
V.02	9	100 Piece(s)		728920

		
≤ 1300		–
1301 – 1800		2
1801 – 2400		4
> 2400		6

[6] Cam, insertable

			Nº
Insertable		100 Piece(s)	334671

		
≤ 1300		–
1301 – 1800		2
1801 – 2400		4
> 2400		6

[22] Tilt distance restrictor; SH ≤ 800 mm / reduce tilt distance

			Nº
For sash stay 500 / 735		10 Piece(s)	502834



INFO

Using the tilt distance restrictor limits the tilt distance of the sash stay to 100 mm.

Width-dependent components

[*] T&T additional stay arm set | 150 kg^[3]

				Nº
V.01	160	10 Piece(s)		728806
V.02	160	10 Piece(s)		728807

Contents:

		#
[60] Additional scissor stay arm, compl. V.01 / V.02		1
[61] Retaining spring, compl.		1
[62] Coupling rod		1
[63] Scissor stay deadbolt		1
[64] Scissor stay guide, compl. T&T		1
[65] T&T stop		1

		
≤ 1300		–
> 1300		1

[3] Installation of the mishandling device on the corner drive / flush-encased gearbox is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)).



[5] Striker			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920
			
≤ 1300			–
> 1300			2

[6] Cam, insertable			
		Nº	
Insertable	100 Piece(s)	334671	
			
≤ 1300			–
> 1300			2

[*] Turn restrictor set, with stop 			
Alternatively:			
Turn restrictor set, braked,  1 → from page 171			
			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

[*]		
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1
		
≤ 1200		–
> 1200		1

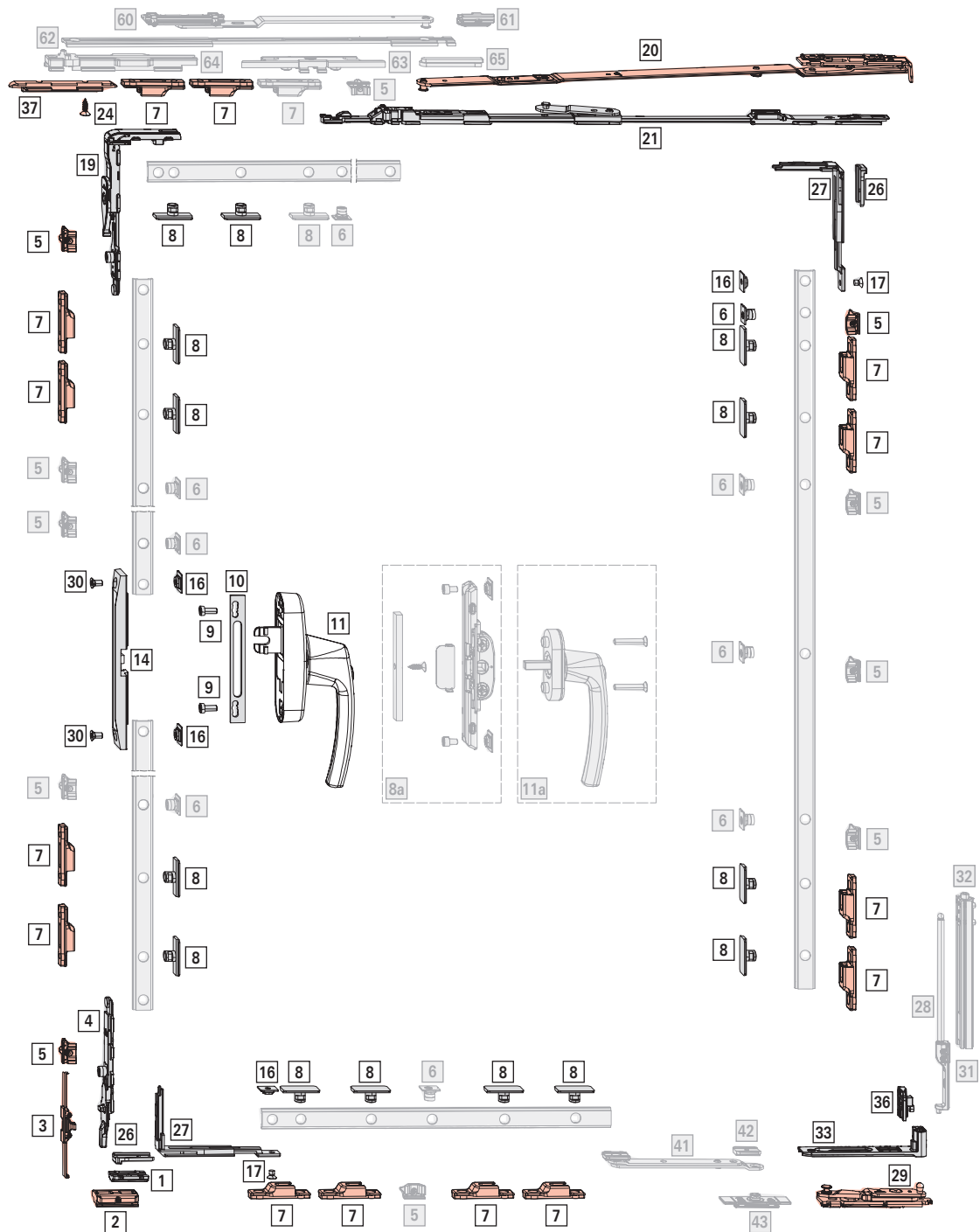
Weight-dependent components

[*] Load transfer set; S.kg > 100 kg 			
			Nº
V.01	Left	10 Piece(s)	739694
	Right	10 Piece(s)	739693
V.02	Left	10 Piece(s)	739696
	Right	10 Piece(s)	739695

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1

4.1.4 T&T | RC 3 | 150 kg





Application range

SW: 700 – 1600 mm

SH: 870 – 3000 mm

S.kg: max. 150 kg



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest with clamp strip

			Nº
No. 1	Left	10 Piece(s)	624970
	Right	10 Piece(s)	624969
No. 3	Left	10 Piece(s)	624972
	Right	10 Piece(s)	624971
No. 4	Left	10 Piece(s)	624974
	Right	10 Piece(s)	624973

[*] Corner hinge set

		Nº
Left	10 Piece(s)	739700
Right	10 Piece(s)	739699

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] T&T locking components set Large packages → from page 158

		Nº
V.01	10 Piece(s)	728804
V.02	10 Piece(s)	728805

Contents:

[*]		#
[1]	Run-up block	1
[2]	Tilt striker	1
[3]	Anti-lifting device V.01 / V.02	1
[4]	Tilt lock bolt	1
[5]	Striker V.01 / V.02	2
[19]	Corner drive with blocking device and retaining fork	1

[21] Scissor stay guide

		Nº
500	10 Piece(s)	740836
735	10 Piece(s)	740838



≤ 900	500
≥ 875	735

[20] Sash stay

					Nº
500	No. 1	130	Left	10 Piece(s)	624945
		130	Right	10 Piece(s)	624944
	No. 3	130	Left	10 Piece(s)	624951
		130	Right	10 Piece(s)	624950
	No. 4	130	Left	10 Piece(s)	624957
		130	Right	10 Piece(s)	624956
735	No. 1	150	Left	10 Piece(s)	624947
		150	Right	10 Piece(s)	624946
	No. 3	150	Left	10 Piece(s)	624953
		150	Right	10 Piece(s)	624952
	No. 4	150	Left	10 Piece(s)	624959
		150	Right	10 Piece(s)	624958



≤ 900	500
≥ 875	735

[*] CL SEC corner drive set Large packages

		Nº
SEC corner drive CL set with retaining fork	10 Piece(s)	728944

[*]		#
[16]	SEC connector	1
[17]	Countersunk screw M5 x 7	1
[26]	SEC retaining fork	1
[27]	CL SEC corner drive	1

[*] SEC rebate-clearance reduction set Large packages → from page 166

			Nº
SEC rebate-clearance reduction set	For corner drives	10 Piece(s)	728950

[*]		#
[24]	Countersunk screw ST4.8 x 16	1
[37]	SEC rebate-clearance reduction CD	1

[7] SEC striker

				Nº
V.01	9	100 Piece(s)		212637
V.02	9	100 Piece(s)		212638

[8] SEC cam **RC 3**

			Nº
Insertable		100 Piece(s)	443530

[5] Striker

				Nº
V.01	9	100 Piece(s)		728918
V.02	9	100 Piece(s)		728920

[6] Cam, insertable

			Nº
Insertable		100 Piece(s)	334671

Espagnolette and connector

[*] SEC espagnolette protection set

Large packages

Alternatively:

[8a] SEC flush-encased gearbox set  1 → *from page 170*

		Nº
SEC espagnolette protection set	10 Piece(s)	728952

Contents:

[*]		#
[14]	SEC espagnolette protection	1
[16]	SEC connector	2
[30]	Countersunk screw M5 x 10	2

[9] Cylinder screw M5 x 12

			Nº
Cylinder screw	M5x12	100 Piece(s)	728925

[10] Espagnolette support

				Nº
Espagnolette support	For Roto Line AL geared-handle	13.5	100 Piece(s)	331937

[11] Roto Line window handle – geared-handle, lockable

→ CTL_1

Alternatively:

[a]	Roto Line window handle, lockable	 1	→ CTL_1
	Countersunk screw M5 x 30	 2	

Height-dependent components

[5] Striker

				Nº
V.01	9	100 Piece(s)		728918
V.02	9	100 Piece(s)		728920

		
≤ 1300		–
1301 – 1800		2
1801 – 2400		4
> 2400		6

[6] Cam, insertable

			Nº
Insertable		100 Piece(s)	334671

		
≤ 1300		–
1301 – 1800		2
1801 – 2400		4
> 2400		6

Width-dependent components

[*] T&T additional stay arm set | 150 kg^[4]

			Nº
V.01	160	10 Piece(s)	728806
V.02	160	10 Piece(s)	728807

Contents:

[*]		#
[60]	Additional scissor stay arm, compl. V.01 / V.02	1
[61]	Retaining spring, compl.	1
[62]	Coupling rod	1
[63]	Scissor stay deadbolt	1
[64]	Scissor stay guide, compl. T&T	1
[65]	T&T stop	1

		
≤ 1300		–
> 1300		1

[5] Striker

				Nº
V.01	9	100 Piece(s)		728918
V.02	9	100 Piece(s)		728920

		
≤ 1300		–
> 1300		2

[4] Installation of the mishandling device on the corner drive / flush-encased gearbox is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)).



[6] Cam, insertable			
		Nº	
Insertable	100 Piece(s)	334671	
			
≤ 1300		–	
> 1300		2	

[7] SEC striker			
			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638
			
≤ 1100		–	
> 1100		1	

[8] SEC cam		RC 3	
		Nº	
Insertable	100 Piece(s)	443530	
			
≤ 1100		–	
> 1100		1	

[*] Turn restrictor set, with stop  1			
Alternatively: Turn restrictor set, braked, damped  1 → from page 171			
			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

[*]		
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1
		
≤ 1200		–
> 1200		1

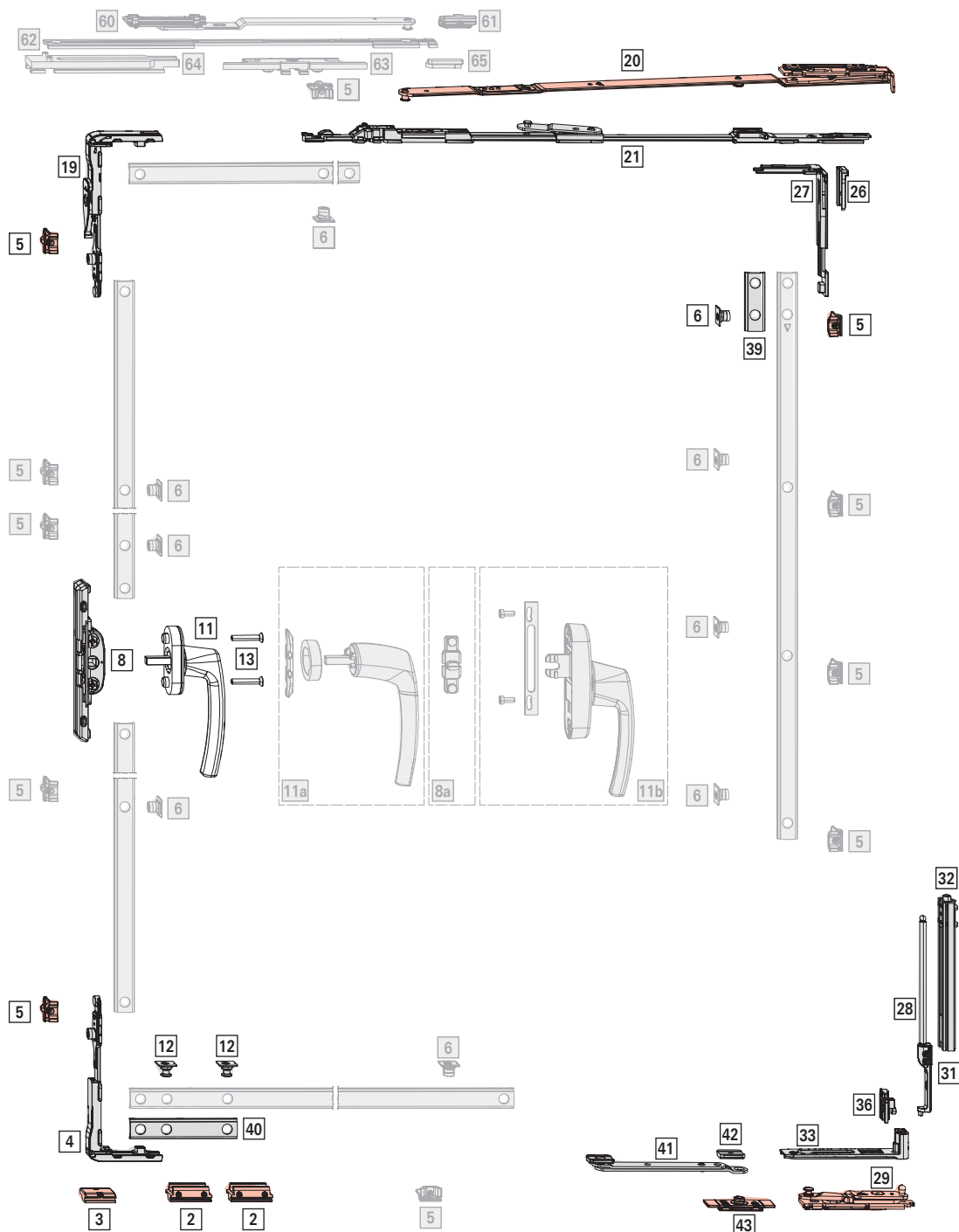
Weight-dependent components

[*] Load transfer set; S.kg > 100 kg  1			
			Nº
V.01	Left	10 Piece(s)	739694
	Right	10 Piece(s)	739693
V.02	Left	10 Piece(s)	739696
	Right	10 Piece(s)	739695

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1

4.1.5 T&T | 180 kg





Application range

SW: 735 – 1600 mm

SH: 1000 – 3000 mm

S.kg: max. 180 kg



DANGER

Risk of death due to insufficient profile stability!

Insufficient profile stability may cause the sash to fall and cause serious or fatal accidents.

1. The hardware configuration must be checked separately.
For S.kg 150 - 180 kg, only profiles with a profile assessment that has been approved by Roto are permissible.



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest 180 kg with clamp strip



			Nº
No. 1	Left	10 Piece(s)	641328
	Right	10 Piece(s)	641327
No. 3	Left	10 Piece(s)	641326
	Right	10 Piece(s)	641325
No. 4	Left	10 Piece(s)	641330
	Right	10 Piece(s)	641329

[*] Corner hinge set 180 kg



		Nº
Left	10 Piece(s)	641334
Right	10 Piece(s)	641297

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] T&T locking components set



Large packages → from page 158

		Nº
V.01	10 Piece(s)	769016
V.02	10 Piece(s)	769017

Contents:

[*]		#
[2]	TF tilt striker	2
[3]	Run-up wedge V.01 / V.02	1
[4]	Corner drive without blocking device, with retaining fork	1
[5]	Striker V.01 / V.02	2
[12]	TF tilt lock bolt	2
[19]	Corner drive with blocking device and retaining fork	1
[40]	Connecting rod, fixed, horizontal, bottom L = 170 mm (CR5)	1

[21] Scissor stay guide



		Nº
735	10 Piece(s)	740838

[20] Sash stay 180 kg



					Nº
735	No. 1	150	Left	10 Piece(s)	641318
		150	Right	10 Piece(s)	641317
	No. 3	150	Left	10 Piece(s)	641320
		150	Right	10 Piece(s)	641319
	No. 4	150	Left	10 Piece(s)	641322
		150	Right	10 Piece(s)	641321

[*] CL corner drive set



Large packages

		Nº
V.01	20 Piece(s)	728842
V.02	20 Piece(s)	728843

Contents:

[*]		#
[5]	Striker V.01 / V.02	2
[6]	Cam, insertable	2
[26]	Retaining fork	1
[27]	CL corner drive	1

[*] Turn restrictor set, with stop



Alternatively:

Turn restrictor set, braked, damped



→ from page 171

			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

[*]		
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1

[*] Load transfer set 			
			Nº
V.01	Left	10 Piece(s)	739694
	Right	10 Piece(s)	739693
V.02	Left	10 Piece(s)	739696
	Right	10 Piece(s)	739695

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1

[39] Connecting rod, fixed, vertical (CR4) 	
→ from page 165	

Espagnolette and connector

[8] Flush-encased gearbox without mishandling device 			
Alternatively: T connector			
→ from page 162			
		Nº	
Flush-encased gearbox without mishandling device	10 Piece(s)	378338	

[11] Roto Line window handle – standard 			
Alternatively: → CTL_1			
[a]	Roto Line window handle – handle without escutcheon	 1	→ CTL_1
	Ring for handle without escutcheon	 1	
	Mounting plate	 1	
[b]	Roto Line window handle – geared-handle	 1	→ CTL_1
	Espagnolette support	 1	→ from page 162
	Cylinder screw M5 x 12	 2	→ from page 167

[13] Countersunk screw M5 x 30 			
		Nº	
Countersunk screw	M5x30	100 Piece(s)	212501

Height-dependent components

[5] Striker 			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

	
≤ 1300	–
1301 – 1800	1
1801 – 2400	3
> 2400	5

[6] Cam, insertable 		
		Nº
Insertable	100 Piece(s)	334671

	
≤ 1300	–
1301 – 1800	1
1801 – 2400	3
> 2400	5

Width-dependent components

[*] T&T additional stay arm set 180 kg ^[5] 			
			Nº
V.01	160	10 Piece(s)	738559
V.02	160	10 Piece(s)	738560

Contents:

[*]		#
[60]	Additional scissor stay arm, compl. V.01 / V.02	1
[61]	Retaining spring, compl.	1
[62]	Coupling rod	1
[63]	Scissor stay deadbolt	1
[64]	Scissor stay guide, compl. T&T	1
[65]	T&T stop	1

	
≤ 1300	–
> 1300	1

[5] Striker 			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

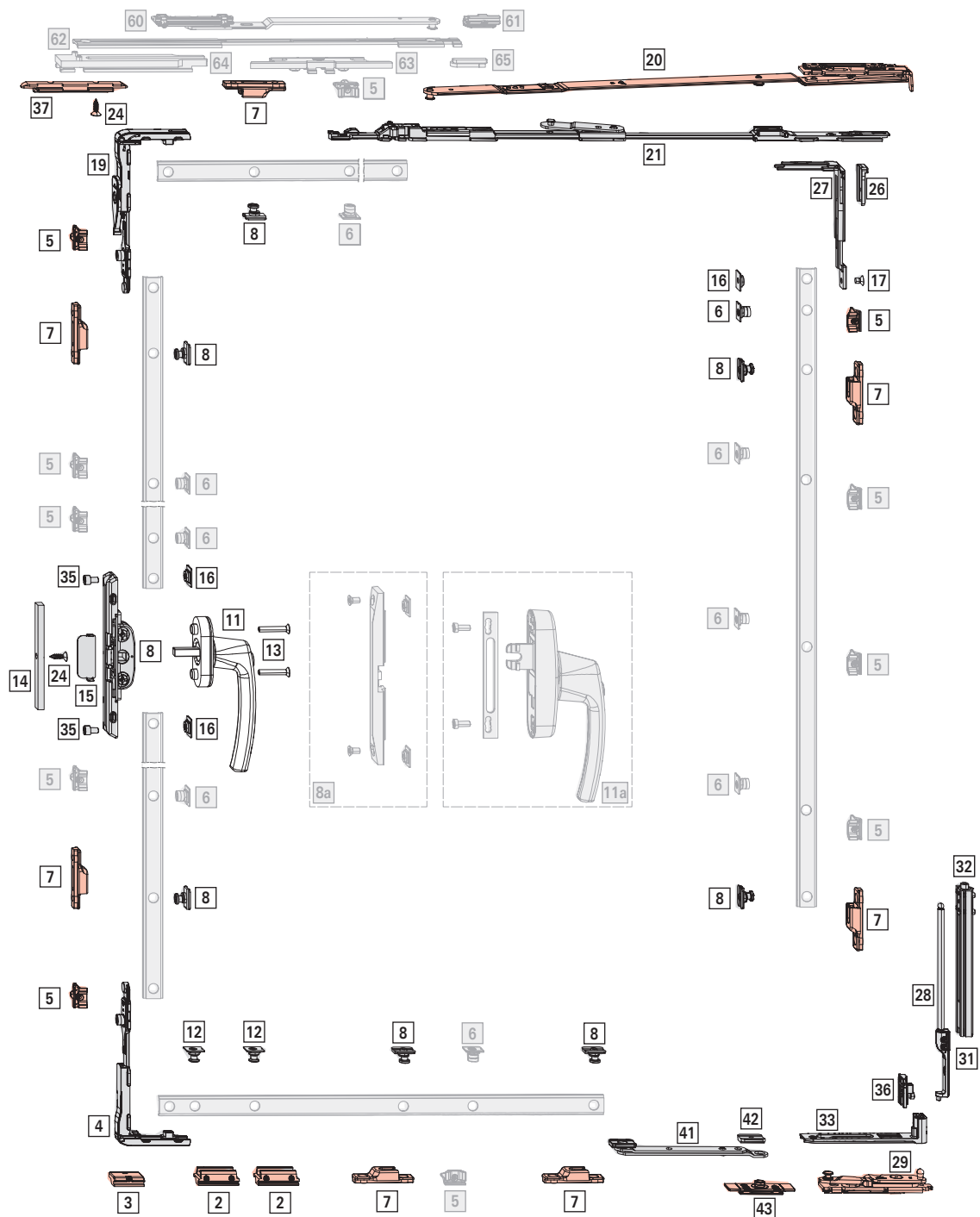
	
≤ 1300	–
> 1300	2

[5] Installation of the mishandling device on the corner drive / flush-encased gearbox is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)).



[6] Cam, insertable		
		Nº
Insertable	100 Piece(s)	334671
		
≤ 1300		–
> 1300		2

4.1.6 T&T | RC 2 | 180 kg





Application range

SW: 800 – 1600 mm

SH: 1000 – 3000 mm

S.kg: max. 180 kg



DANGER

Risk of death due to insufficient profile stability!

Insufficient profile stability may cause the sash to fall and cause serious or fatal accidents.

1. The hardware configuration must be checked separately.

For S.kg 150 - 180 kg, only profiles with a profile assessment that has been approved by Roto are permissible.



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest 180 kg with clamp strip 			
			Nº
No. 1	Left	10 Piece(s)	641328
	Right	10 Piece(s)	641327
No. 3	Left	10 Piece(s)	641326
	Right	10 Piece(s)	641325
No. 4	Left	10 Piece(s)	641330
	Right	10 Piece(s)	641329

[*] Corner hinge set 180 kg 			
		Nº	
Left	10 Piece(s)	641334	
Right	10 Piece(s)	641297	

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] T&T locking components set 			
Large packages → from page 158			
		Nº	
V.01	10 Piece(s)	769016	
V.02	10 Piece(s)	769017	

Contents:

[*]		#
[2]	TF tilt striker	2
[3]	Run-up wedge V.01 / V.02	2
[4]	Corner drive without blocking device, with retaining fork	1
[5]	Striker V.01 / V.02	2
[12]	TF tilt lock bolt	2
[19]	Corner drive with blocking device and retaining fork	1

[21] Scissor stay guide 			
		Nº	
735	10 Piece(s)	740838	

[20] Sash stay 180 kg 					
					Nº
735	No. 1	150	Left	10 Piece(s)	641318
		150	Right	10 Piece(s)	641317
	No. 3	150	Left	10 Piece(s)	641320
		150	Right	10 Piece(s)	641319
	No. 4	150	Left	10 Piece(s)	641322
		150	Right	10 Piece(s)	641321

[*] CL SEC corner drive set 			
Large packages			
		Nº	
SEC corner drive CL set with retaining fork		10 Piece(s)	728944

[*]		#
[16]	SEC connector	1
[17]	Countersunk screw M5 x 7	1
[26]	SEC retaining fork	1
[27]	CL SEC corner drive	1

[*] SEC rebate-clearance reduction set 			
Large packages → from page 166			
			Nº
SEC rebate-clearance reduction set		For corner drives 10 Piece(s)	728950

[*]		#
[24]	Countersunk screw ST4.8 x 16	1
[37]	SEC rebate-clearance reduction CD	1

[7] SEC striker 			
			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638

[8] SEC cam		RC 2	
		Nº	
Insertable	100 Piece(s)	447245	

[5] Striker			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

[6] Cam, insertable			
		Nº	
Insertable	100 Piece(s)	334671	

[*] Turn restrictor set, with stop			
Alternatively: Turn restrictor set, braked, damped			
			→ from page 171
			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

[*]		
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1

[*] Load transfer set			
			Nº
V.01	Left	10 Piece(s)	739694
	Right	10 Piece(s)	739693
V.02	Left	10 Piece(s)	739696
	Right	10 Piece(s)	739695

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1

Espagnolette and connector

[*] SEC flush-encased gearbox set			
Large packages → from page 163			
Alternatively:			
[8a]	SEC espagnolette protection set		→ from page 162
		Nº	
SEC flush-encased gearbox set	10 Piece(s)	728947	

Contents:

[*]		#
[8]	SEC flush-encased gearbox without blocking device	1
[14]	SEC rebate-clearance reduction flush-encased gearbox	1
[15]	SEC drilling protection	1
[16]	SEC connector	2
[24]	Countersunk screw ST4.8 x 16	1
[35]	Cylinder screw M5 x 8	2

[14] SEC rebate-clearance reduction flush-encased gearbox			
			Nº
SEC rebate-clearance reduction ESP	For Roto Line lock handles	50 Piece(s)	334360

[15] SEC drilling protection			
			Nº
SEC drilling protection	For Roto Line lock handles	10 Piece(s)	487406

[24] Countersunk screw ST4.8 x 16			
			Nº
Countersunk screw	ST4,8x16	100 Piece(s)	728933

[11] Roto Line window handle, lockable			
→ CTL_1			
Alternatively:			
[a]	Roto Line window handle – geared-handle, lockable		→ CTL_1
	Espagnolette support		→ from page 162
	Cylinder screw M5 x 12		→ from page 167

[13] Countersunk screw M5 x 30			
			Nº
Countersunk screw	M5x30	100 Piece(s)	212501

Height-dependent components

[5] Striker			Nº
			
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920
			
≤ 1300			–
1301 – 1800			2
1801 – 2400			4
> 2400			6



[6] Cam, insertable		
		Nº
Insertable	100 Piece(s)	334671
		
≤ 1300		–
1301 – 1800		2
1801 – 2400		4
> 2400		6

Width-dependent components

[*] T&T additional stay arm set 180 kg ^[6]			
			Nº
V.01	160	10 Piece(s)	738559
V.02	160	10 Piece(s)	738560

Contents:

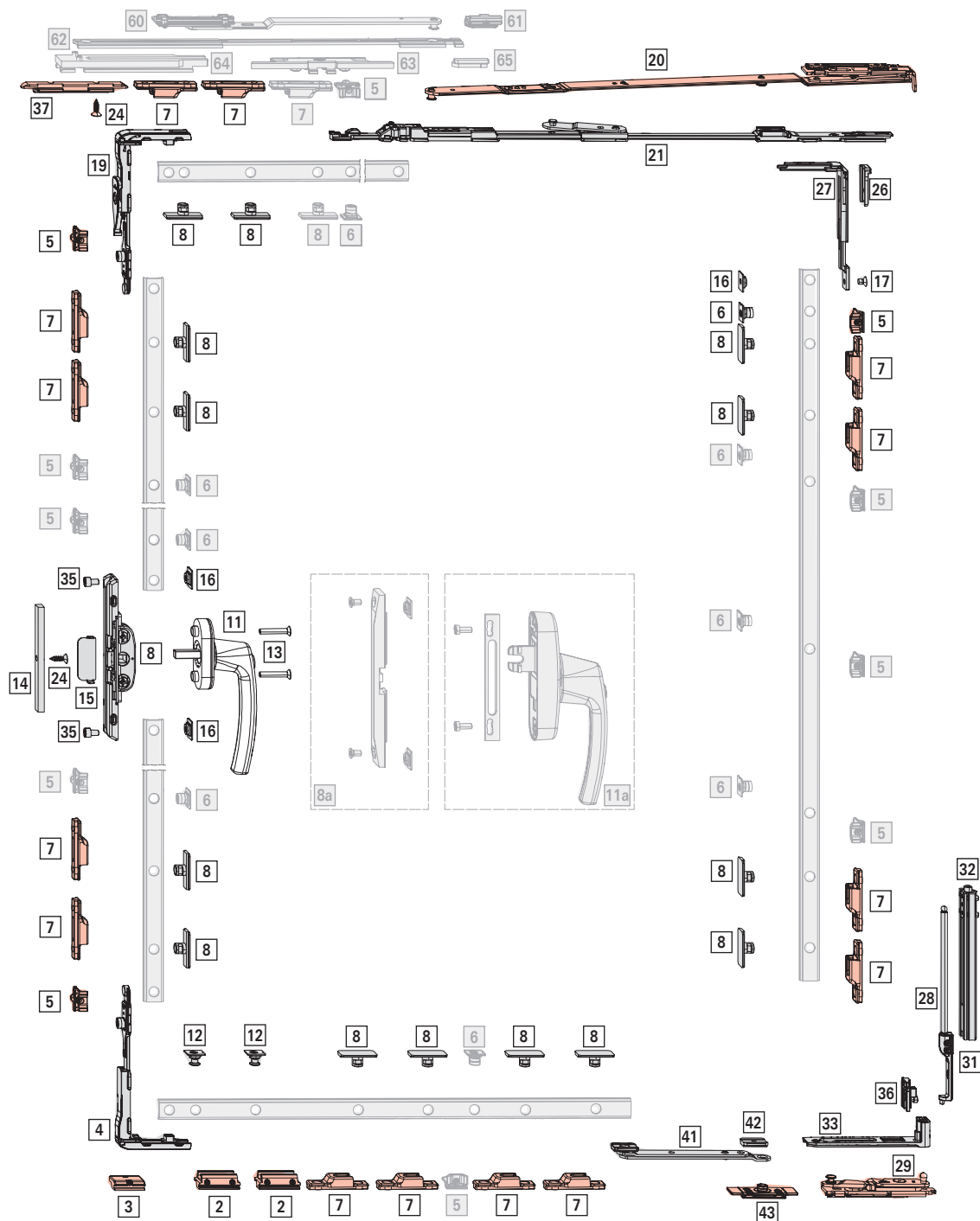
[*]		#
[60]	Additional scissor stay arm, compl. V.01 / V.02	1
[61]	Retaining spring, compl.	1
[62]	Coupling rod	1
[63]	Scissor stay deadbolt	1
[64]	Scissor stay guide, compl. T&T	1
[65]	T&T stop	1
		
≤ 1300		–
> 1300		1

[5] Striker			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920
			
≤ 1300			–
> 1300			2

[6] Cam, insertable		
		Nº
Insertable	100 Piece(s)	334671
		
≤ 1300		–
> 1300		2

[6] Installation of the mishandling device on the corner drive / flush-encased gearbox is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)).

4.1.7 T&T | RC 3 | 180 kg





Application range

SW: 915 – 1600 mm

SH: 1000 – 3000 mm

S.kg: max. 180 kg



DANGER

Risk of death due to insufficient profile stability!

Insufficient profile stability may cause the sash to fall and cause serious or fatal accidents.

1. The hardware configuration must be checked separately.

For S.kg 150 - 180 kg, only profiles with a profile assessment that has been approved by Roto are permissible.



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest 180 kg with clamp strip



			Nº
No. 1	Left	10 Piece(s)	641328
	Right	10 Piece(s)	641327
No. 3	Left	10 Piece(s)	641326
	Right	10 Piece(s)	641325
No. 4	Left	10 Piece(s)	641330
	Right	10 Piece(s)	641329

[*] Corner hinge set 180 kg



		Nº
Left	10 Piece(s)	641334
Right	10 Piece(s)	641297

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] T&T locking components set



Large packages → from page 158

		Nº
V.01	10 Piece(s)	769016
V.02	10 Piece(s)	769017

Contents:

[*]		#
[2]	TF tilt striker	2
[3]	Run-up wedge V.01 / V.02	2
[4]	Corner drive without blocking device, with retaining fork	1
[5]	Striker V.01 / V.02	2
[12]	TF tilt lock bolt	2
[19]	Corner drive with blocking device and retaining fork	1

[21] Scissor stay guide



		Nº
735	10 Piece(s)	740838

[20] Sash stay 180 kg



					Nº
735	No. 1	150	Left	10 Piece(s)	641318
		150	Right	10 Piece(s)	641317
	No. 3	150	Left	10 Piece(s)	641320
		150	Right	10 Piece(s)	641319
	No. 4	150	Left	10 Piece(s)	641322
		150	Right	10 Piece(s)	641321

[*] CL SEC corner drive set



Large packages

		Nº
SEC corner drive CL set with retaining fork	10 Piece(s)	728944

[*]		#
[16]	SEC connector	1
[17]	Countersunk screw M5 x 7	1
[26]	SEC retaining fork	1
[27]	CL SEC corner drive	1

[*] SEC rebate-clearance reduction set



Large packages → from page 166

			Nº
SEC rebate-clearance reduction set	For corner drives	10 Piece(s)	728950

[*]		#
[24]	Countersunk screw ST4.8 x 16	1
[37]	SEC rebate-clearance reduction CD	1

[7] SEC striker



			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638

[8] SEC cam		RC 3	🛒 14
		Nº	
Insertable	100 Piece(s)	443530	

[5] Striker			🛒 1
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

[6] Cam, insertable			🛒 1
		Nº	
Insertable	100 Piece(s)	334671	

[*] Turn restrictor set, with stop			🛒 1
Alternatively: Turn restrictor set, braked,  1 → from page 171			
			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

[*]		🛒
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1

[*] Load transfer set			🛒 1
			Nº
V.01	Left	10 Piece(s)	739694
	Right	10 Piece(s)	739693
V.02	Left	10 Piece(s)	739696
	Right	10 Piece(s)	739695

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1

Espagnolette and connector

[*] SEC flush-encased gearbox set			🛒 1
Large packages → from page 163			
Alternatively:			
[8a]	SEC espagnolette protection set	 1	→ from page 162
		Nº	
SEC flush-encased gearbox set		10 Piece(s)	728947

Contents:

[*]		#
[8]	SEC flush-encased gearbox without blocking device	1
[14]	SEC rebate-clearance reduction flush-encased gearbox	1
[15]	SEC drilling protection	1
[16]	SEC connector	2
[24]	Countersunk screw ST4.8 x 16	1
[35]	Cylinder screw M5 x 8	2

[14] SEC rebate-clearance reduction flush-encased gearbox			🛒 1
			Nº
SEC rebate-clearance reduction ESP	For Roto Line lock handles	50 Piece(s)	334360

[15] SEC drilling protection			🛒 1
			Nº
SEC drilling protection	For Roto Line lock handles	10 Piece(s)	487406

[24] Countersunk screw ST4.8 x 16			🛒 1
			Nº
Countersunk screw	ST4,8x16	100 Piece(s)	728933

[11] Roto Line window handle, lockable			🛒 1
→ CTL_1			
Alternatively:			
[a]	Roto Line window handle – geared-handle, lockable	 1	→ CTL_1
	Espagnolette support	 1	→ from page 162
	Cylinder screw M5 x 12	 2	→ from page 167

[13] Countersunk screw M5 x 30			🛒 1
			Nº
Countersunk screw	M5x30	100 Piece(s)	212501

Height-dependent components

[5] Striker			Nº
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920
			
≤ 1300			–
1301 – 1800			2
1801 – 2400			4
> 2400			6



[6] Cam, insertable		
		Nº
Insertable	100 Piece(s)	334671
		
≤ 1300		–
1301 – 1800		2
1801 – 2400		4
> 2400		6

Width-dependent components

[*] T&T additional stay arm set 180 kg ^[7]			
			Nº
V.01	160	10 Piece(s)	738559
V.02	160	10 Piece(s)	738560

Contents:

[*]		#
[60]	Additional scissor stay arm, compl. V.01 / V.02	1
[61]	Retaining spring, compl.	1
[62]	Coupling rod	1
[63]	Scissor stay deadbolt	1
[64]	Scissor stay guide, compl. T&T	1
[65]	T&T stop	1
		
≤ 1300		–
> 1300		1

[5] Striker			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920
			
≤ 1300			—
> 1300			2

[6] Cam, insertable		
		Nº
Insertable	100 Piece(s)	334671
		
≤ 1300		–
> 1300		2

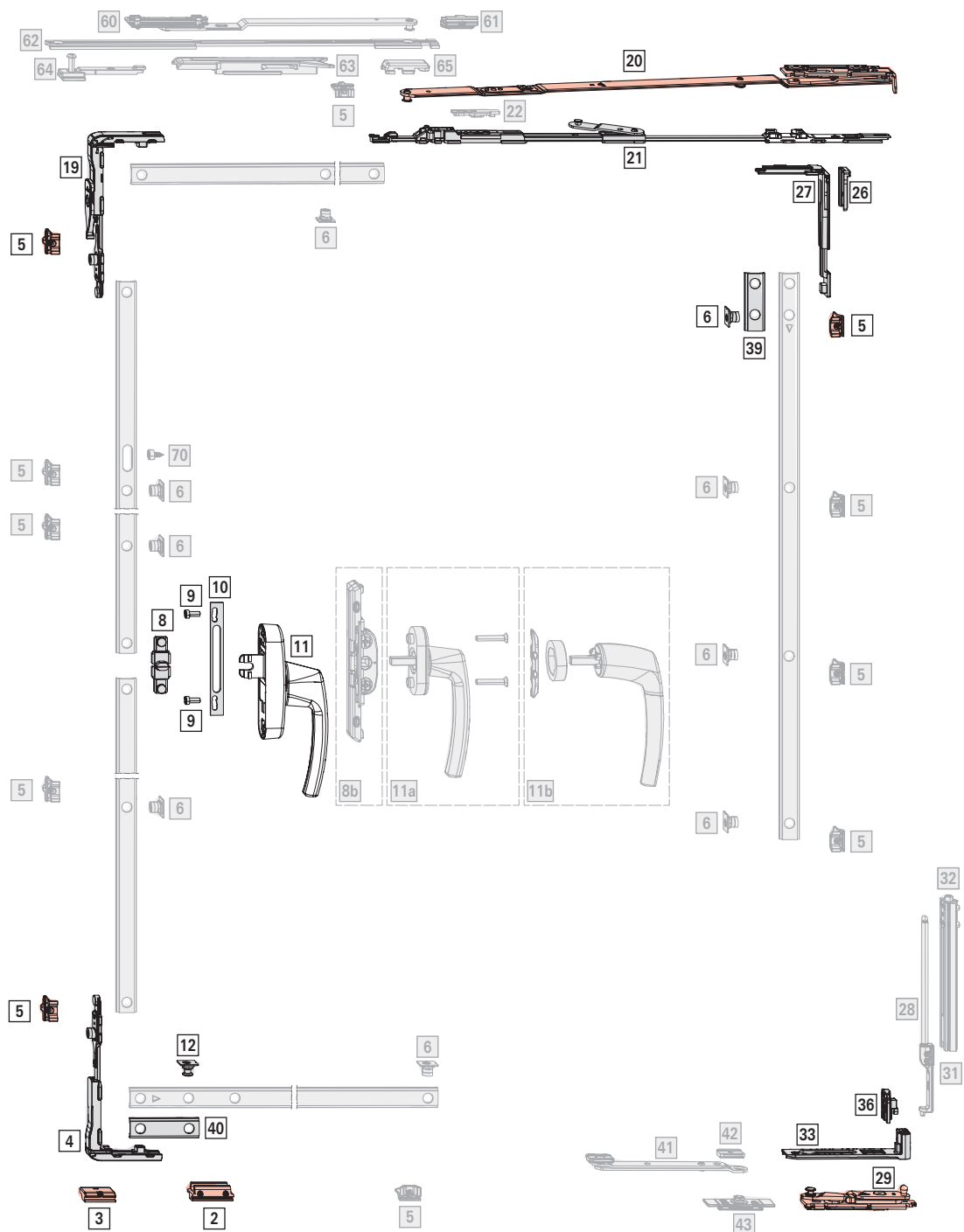
[7] SEC striker			
			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638

			
≤ 1100			–
> 1100			1

[8] SEC cam			RC 3
		Nº	
Insertable	100 Piece(s)	443530	
			
≤ 1100			–
> 1100			1

[7] Installation of the mishandling device on the corner drive / flush-encased gearbox is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)).

4.2.1 TF / TiSs | 150 kg





Application range

SW: 500 – 1600 mm

SH: 555 – 3000 mm

S.kg: max. 150 kg



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest with clamp strip 1

				Nº
No. 1	Left	10 Piece(s)		624970
	Right	10 Piece(s)		624969
No. 3	Left	10 Piece(s)		624972
	Right	10 Piece(s)		624971
No. 4	Left	10 Piece(s)		624974
	Right	10 Piece(s)		624973

[*] Corner hinge set 1

			Nº
Left		10 Piece(s)	739700
Right		10 Piece(s)	739699

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] TF locking components set 1

			Nº
V.01		10 Piece(s)	728976
V.02		10 Piece(s)	728977

Contents:

[*]		#
[2]	TF tilt striker	1
[3]	Run-up wedge V.01 / V.02	1
[4]	Corner drive without blocking device, with retaining fork	1
[5]	Striker V.01 / V.02	2
[12]	TF tilt lock bolt	1
[19]	Corner drive with blocking device and retaining fork	1

[21] TF scissor stay guide 1

			Nº
500		10 Piece(s)	740837
735		10 Piece(s)	740839



		Nº
≤ 735		500
> 735		735

[20] Sash stay 1

						Nº
500	No. 1	130	Left	10 Piece(s)		624945
		130	Right	10 Piece(s)		624944
	No. 3	130	Left	10 Piece(s)		624951
		130	Right	10 Piece(s)		624950
	No. 4	130	Left	10 Piece(s)		624957
		130	Right	10 Piece(s)		624956
735	No. 1	150	Left	10 Piece(s)		624947
		150	Right	10 Piece(s)		624946
	No. 3	150	Left	10 Piece(s)		624953
		150	Right	10 Piece(s)		624952
	No. 4	150	Left	10 Piece(s)		624959
		150	Right	10 Piece(s)		624958



		Nº
≤ 735		500
> 735		735

[*] CL corner drive set 1

			Nº
V.01		20 Piece(s)	728842
V.02		20 Piece(s)	728843

Contents:

[*]		#
[5]	Striker V.01 / V.02	2
[6]	Cam, insertable	2
[26]	Retaining fork	1
[27]	CL corner drive	1

[39] Connecting rod, fixed, vertical (CR4) 1

→ from page 165

[40] Connecting rod, fixed, horizontal, bottom (CR5)

→ from page 165

[70] Locking sleeve 1

				Nº
Locking sleeve	Blocks the movement of the espagnolette (90°)		100 Piece(s)	738549

Hardware overviews

TiltFirst hardware / Tilt-Only hardware, handle at the side

TF / TiSs | 150 kg

Espagnolette and connector

[*] T connector set 			
Alternatively:			
[8a]	Flush-encased gearbox 	1	→ from page 163
		Nº	
AL T connector set	10 Piece(s)	728981	

Contents:

[*]		
[8]	T connector	1
[9]	Cylinder screw M5 x 12	2

[10] Espagnolette support 			
			Nº
Espagnolette support	For Roto Line AL geared-handle	13.5 100 Piece(s)	331937

[11] Roto Line window handle – geared-handle 			
Alternatively: → CTL_1			
[a]	Roto Line window handle – standard		1 → CTL_1
	Countersunk screw M5 x 30		2
[b]	Roto Line window handle – handle without escutcheon		1 → CTL_1
	Ring for handle without escutcheon		1
	Mounting plate		1

Height-dependent components

[5] Striker 			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

	
≤ 1300	–
1301 – 1800	1
1801 – 2400	3
> 2400	5

[6] Cam, insertable 			
		Nº	
Insertable	100 Piece(s)	334671	

	
≤ 1300	–
1301 – 1800	1
1801 – 2400	3
> 2400	5

[8] Installation of the mishandling device on the corner drive / flush-encased gearbox is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)).

[22] Tilt distance restrictor; SH ≤ 800 mm / reduce tilt distance 			
		Nº	
For sash stay 500 / 735	10 Piece(s)	502834	

	INFO
Using the tilt distance restrictor limits the tilt distance of the sash stay to 100 mm.	

Width-dependent components

[*] TF additional stay arm set 150 kg ^[8] ; SW > 1300 mm 			
			Nº
V.01	160	10 Piece(s)	728978
V.02	160	10 Piece(s)	728979

Contents:

[*]		#
[60]	Additional scissor stay arm, compl. V.01 / V.02	1
[61]	Retaining spring, compl.	1
[62]	Coupling rod	1
[63]	Scissor stay guide, compl. TF	1
[64]	Additional stay arm stop, compl. TF 150 kg	1
[65]	Coupler component, compl.	1

	
≤ 1300	–
> 1300	1

[5] Striker 			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

	
≤ 1300	–
> 1300	2

[6] Cam, insertable 			
		Nº	
Insertable	100 Piece(s)	334671	

	
≤ 1300	–
> 1300	2

[*] Turn restrictor set, with stop 			
Alternatively:			



Turn restrictor set, braked, damped  1 → from page 171			
			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

[*]		
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1
		
≤ 1200		–
> 1200		1

Weight-dependent components

[*] Load transfer set; S.kg > 100 kg  1			
			Nº
V.01	Left	10 Piece(s)	739694
	Right	10 Piece(s)	739693
V.02	Left	10 Piece(s)	739696
	Right	10 Piece(s)	739695

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1

This exploded view diagram illustrates the assembly of a window frame. The components are numbered 1 through 43. The diagram shows the following parts and their assembly sequence:

- Top Rail (1)**: The main horizontal frame component.
- Side Rails (2, 3)**: The vertical frame components.
- Bottom Rail (4)**: The main horizontal frame component at the bottom.
- Corner Brackets (5, 6, 7, 8)**: Used to secure the rails together at the corners.
- Handle (11)**: The central control component.
- Handle Mounting (10, 9, 16)**: Components used to attach the handle to the frame.
- Locking Mechanism (11a, 8a)**: Detailed view of the handle's internal components.
- Window Glass (14)**: The main viewing pane.
- Weatherstripping (15, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43)**: Various seals and gaskets used to ensure the window is airtight and watertight.

The diagram includes detailed assembly instructions for each part, such as "Insert the handle into the handle mounting" and "Secure the handle with the handle mounting screws".



Application range

SW: 625 – 1600 mm

SH: 720 – 3000 mm

S.kg: max. 150 kg



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest with clamp strip 1

				Nº
No. 1	Left	10 Piece(s)		624970
	Right	10 Piece(s)		624969
No. 3	Left	10 Piece(s)		624972
	Right	10 Piece(s)		624971
No. 4	Left	10 Piece(s)		624974
	Right	10 Piece(s)		624973

[*] Corner hinge set 1

			Nº
Left		10 Piece(s)	739700
Right		10 Piece(s)	739699

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] TF locking components set 1

			Nº
V.01		10 Piece(s)	728976
V.02		10 Piece(s)	728977

Contents:

[*]		#
[2]	TF tilt striker	1
[3]	Run-up wedge V.01 / V.02	1
[4]	Corner drive without blocking device, with retaining fork	1
[5]	Striker V.01 / V.02	2
[12]	TF tilt lock bolt	1
[19]	Corner drive with blocking device and retaining fork	1

[21] TF scissor stay guide 1

			Nº
500		10 Piece(s)	740837
735		10 Piece(s)	740839
			
≤ 900			500
≥ 800			735

[20] Sash stay 1

					Nº
500	No. 1	130	Left	10 Piece(s)	624945
		130	Right	10 Piece(s)	624944
	No. 3	130	Left	10 Piece(s)	624951
		130	Right	10 Piece(s)	624950
	No. 4	130	Left	10 Piece(s)	624957
		130	Right	10 Piece(s)	624956
735	No. 1	150	Left	10 Piece(s)	624947
		150	Right	10 Piece(s)	624946
	No. 3	150	Left	10 Piece(s)	624953
		150	Right	10 Piece(s)	624952
	No. 4	150	Left	10 Piece(s)	624959
		150	Right	10 Piece(s)	624958

[*] CL SEC corner drive set 1
Large packages

			Nº
SEC corner drive CL set with retaining fork		10 Piece(s)	728944
[*]		#	
[16]	SEC connector	1	
[17]	Countersunk screw M5 x 7	1	
[26]	SEC retaining fork	1	
[27]	CL SEC corner drive	1	

[*] SEC rebate-clearance reduction set 1
Large packages → from page 166

				Nº
SEC rebate-clearance reduction set		For corner drives	10 Piece(s)	728950
[*]		#		
[24]	Countersunk screw ST4.8 x 16	1		
[37]	SEC rebate-clearance reduction CD	1		

Hardware overviews

TiltFirst hardware / Tilt-Only hardware, handle at the side

TF / TiSs | RC 2 | 150 kg

[7] SEC striker 			
			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638

[8] SEC cam RC 2 			
			Nº
Insertable		100 Piece(s)	447245

[5] Striker 			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

[6] Cam, insertable 			
			Nº
Insertable		100 Piece(s)	334671

Designed as Tilt-Only hardware, handle at the side

[70] Locking sleeve 			
			Nº
Locking sleeve	Blocks the movement of the espagnolette (90°)	100 Piece(s)	738549

Espagnolette and connector

[*] SEC espagnolette protection set 			
Large packages			
Alternatively:			
[8a]	SEC flush-encased gearbox set 	1	→ from page 170
			Nº
SEC espagnolette protection set		10 Piece(s)	728952

Contents:

[*]		#
[14]	SEC espagnolette protection	1
[16]	SEC connector	2
[30]	Countersunk screw M5 x 10	2

[9] Cylinder screw M5 x 12 			
			Nº
Cylinder screw	M5x12	100 Piece(s)	728925

[10] Espagnolette support 			
			Nº
Espagnolette support	For Roto Line AL geared-handle	13.5 100 Piece(s)	331937

[9] Installation of the mishandling device on the corner drive / flush-encased gearbox is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)).

[11] Roto Line window handle – geared-handle, lockable 			
→ CTL_1			
Alternatively:			
[a]	Roto Line window handle, lockable 	1	→ CTL_1
	Countersunk screw M5 x 30 	2	

Height-dependent components

[5] Striker 			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920
			
≤ 1300			–
1301 – 1800			2
1801 – 2400			4
> 2400			6

[6] Cam, insertable 			
			Nº
Insertable		100 Piece(s)	334671
			
≤ 1300			–
1301 – 1800			2
1801 – 2400			4
> 2400			6

[22] Tilt distance restrictor; SH ≤ 800 mm / reduce tilt distance 			
			Nº
For sash stay 500 / 735		10 Piece(s)	502834

INFO Using the tilt distance restrictor limits the tilt distance of the sash stay to 100 mm.

Width-dependent components

[*] TF additional stay arm set 150 kg ^[9] ; SW > 1300 mm 			
			Nº
V.01	160	10 Piece(s)	728978
V.02	160	10 Piece(s)	728979

Contents:

[*]		#
[60]	Additional scissor stay arm, compl. V.01 / V.02	1
[61]	Retaining spring, compl.	1
[62]	Coupling rod	1

Hardware overviews

TiltFirst hardware / Tilt-Only hardware, handle at the side

TF / TiSs | RC 2 | 150 kg



[*]		#
[63]	Scissor stay guide, compl. TF	1
[64]	Additional stay arm stop, compl. TF	1
[65]	Coupler component, compl.	1
≤ 1300		–
> 1300		1

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1

[5] Striker			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920
≤ 1300		–	
> 1300		2	

[6] Cam, insertable			
			Nº
Insertable	100 Piece(s)		334671
≤ 1300		–	
> 1300		2	

[*] Turn restrictor set, with stop			
Alternatively:			
Turn restrictor set, braked, damped		1	→ from page 171
			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

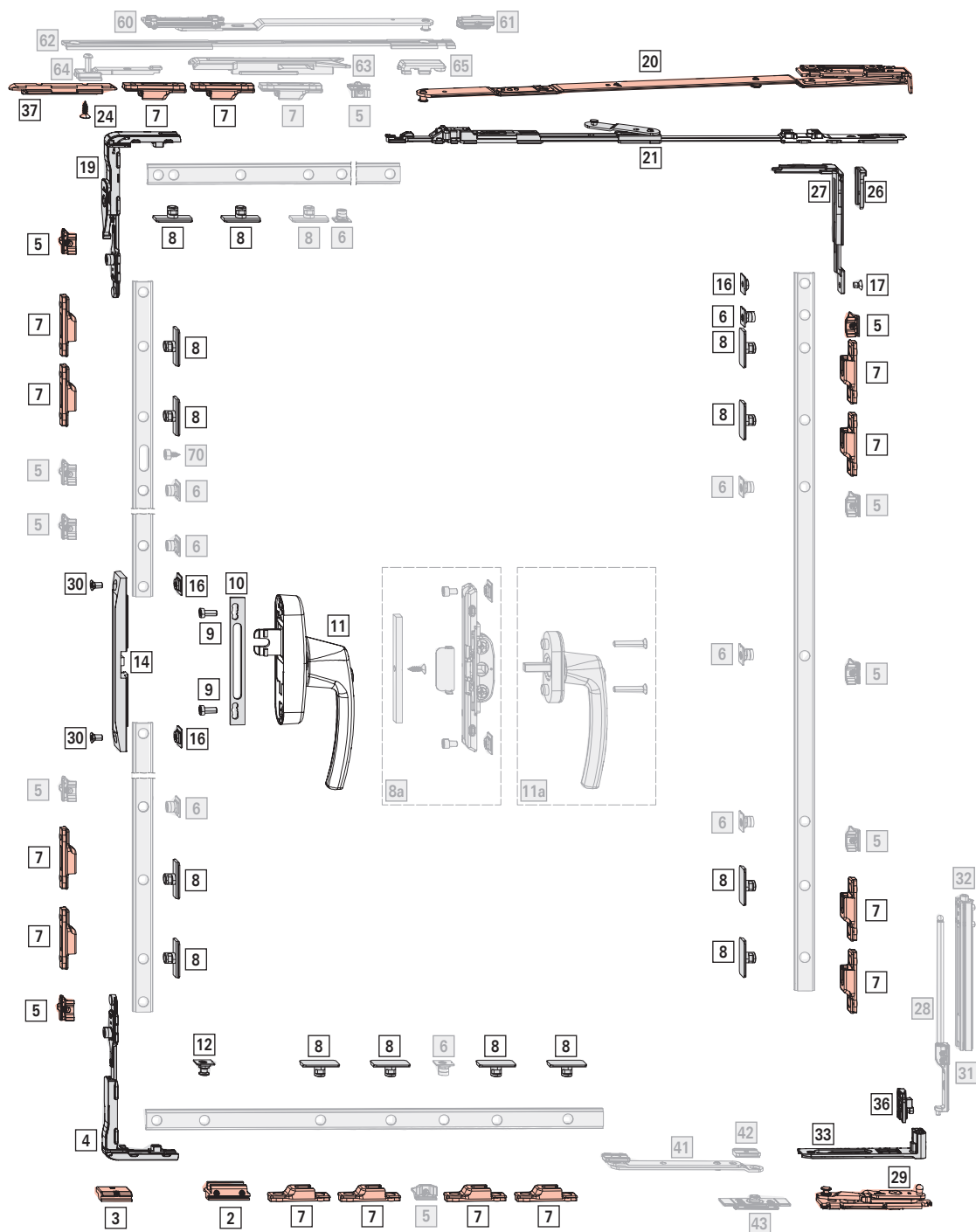
Contents:

[*]		
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1
≤ 1200		–
> 1200		1

Weight-dependent components

[*] Load transfer set; S.kg > 100 kg			
			Nº
V.01	Left	10 Piece(s)	739694
	Right	10 Piece(s)	739693
V.02	Left	10 Piece(s)	739696
	Right	10 Piece(s)	739695

4.2.3 TF / TiSs | RC 3 | 150 kg





Application range

SW: 700 – 1600 mm

SH: 870 – 3000 mm

S.kg: max. 150 kg



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest with clamp strip 1

				Nº
No. 1	Left	10 Piece(s)		624970
	Right	10 Piece(s)		624969
No. 3	Left	10 Piece(s)		624972
	Right	10 Piece(s)		624971
No. 4	Left	10 Piece(s)		624974
	Right	10 Piece(s)		624973

[*] Corner hinge set 1

			Nº
Left		10 Piece(s)	739700
Right		10 Piece(s)	739699

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] TF locking components set 1

			Nº
V.01		10 Piece(s)	728976
V.02		10 Piece(s)	728977

Contents:

[*]		#
[2]	TF tilt striker	1
[3]	Run-up wedge V.01 / V.02	1
[4]	Corner drive without blocking device, with retaining fork	1
[5]	Striker V.01 / V.02	2
[12]	TF tilt lock bolt	1
[19]	Corner drive with blocking device and retaining fork	1

[21] TF scissor stay guide 1

			Nº
500		10 Piece(s)	740837
735		10 Piece(s)	740839



	
≤ 900	500
≥ 875	735

[20] Sash stay 1

						Nº
500	No. 1	130	Left	10 Piece(s)		624945
		130	Right	10 Piece(s)		624944
	No. 3	130	Left	10 Piece(s)		624951
		130	Right	10 Piece(s)		624950
	No. 4	130	Left	10 Piece(s)		624957
		130	Right	10 Piece(s)		624956
735	No. 1	150	Left	10 Piece(s)		624947
		150	Right	10 Piece(s)		624946
	No. 3	150	Left	10 Piece(s)		624953
		150	Right	10 Piece(s)		624952
	No. 4	150	Left	10 Piece(s)		624959
		150	Right	10 Piece(s)		624958



	
≤ 900	500
≥ 875	735

[*] CL SEC corner drive set 1

Large packages

			Nº
SEC corner drive CL set with retaining fork		10 Piece(s)	728944

[*]		#
[16]	SEC connector	1
[17]	Countersunk screw M5 x 7	1
[26]	SEC retaining fork	1
[27]	CL SEC corner drive	1

[*] SEC rebate-clearance reduction set 1

Large packages → from page 166

				Nº
SEC rebate-clearance reduction set		For corner drives	10 Piece(s)	728950

[*]		#
[24]	Countersunk screw ST4.8 x 16	1
[37]	SEC rebate-clearance reduction CD	1

Hardware overviews

TiltFirst hardware / Tilt-Only hardware, handle at the side

TF / TiSs | RC 3 | 150 kg

[7] SEC striker 🛒 14			
			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638

[8] SEC cam RC 3 🛒 14			
			Nº
Insertable	100 Piece(s)		443530

[5] Striker 🛒 1			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

[6] Cam, insertable 🛒 1			
			Nº
Insertable	100 Piece(s)		334671

Designed as Tilt-Only hardware, handle at the side

[70] Locking sleeve 🛒 1			
			Nº
Locking sleeve	Blocks the movement of the espagnolette (90°)	100 Piece(s)	738549

Espagnolette and connector

[*] SEC espagnolette protection set 🛒 1			
Large packages Alternatively:			
[8a] SEC flush-encased gearbox set 🛒 1 → from page 170			
			Nº
SEC espagnolette protection set	10 Piece(s)		728952

Contents:

[*]		#
[14]	SEC espagnolette protection	1
[16]	SEC connector	2
[30]	Countersunk screw M5 x 10	2

[9] Cylinder screw M5 x 12 🛒 2			
			Nº
Cylinder screw	M5x12	100 Piece(s)	728925

[10] Espagnolette support 🛒 1			
			Nº
Espagnolette support	For Roto Line AL geared-handle	13.5 100 Piece(s)	331937

[10] Installation of the mishandling device on the corner drive / flush-encased gearbox is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)).

[11] Roto Line window handle – geared-handle, lockable 🛒 1			
→ CTL_1			
Alternatively:			
[a]	Roto Line window handle, lockable	🛒 1	→ CTL_1
	Countersunk screw M5 x 30	🛒 2	

Height-dependent components

[5] Striker			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920
			
≤ 1300			–
1301 – 1800			2
1801 – 2400			4
> 2400			6

[6] Cam, insertable			
			Nº
Insertable	100 Piece(s)		334671
			
≤ 1300			–
1301 – 1800			2
1801 – 2400			4
> 2400			6

Width-dependent components

[*] TF additional stay arm set 150 kg ^[10] ; SW > 1300 mm			
			Nº
V.01	160	10 Piece(s)	728978
V.02	160	10 Piece(s)	728979

Contents:

[*]		#
[60]	Additional scissor stay arm, compl. V.01 / V.02	1
[61]	Retaining spring, compl.	1
[62]	Coupling rod	1
[63]	Scissor stay guide, compl. TF	1
[64]	Additional stay arm stop, compl. TF	1
[65]	Coupler component, compl.	1

			
≤ 1300			–
> 1300			1



[5] Striker

			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920
			
≤ 1300			–
> 1300			2

[6] Cam, insertable

		Nº
Insertable	100 Piece(s)	334671
		
≤ 1300		–
> 1300		2

[7] SEC striker

			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638
			
≤ 1200			–
> 1200			1

[8] SEC cam RC 3

		Nº
Insertable	100 Piece(s)	443530
		
≤ 1200		–
> 1200		1

[*] Turn restrictor set, with stop

Alternatively:

Turn restrictor set, braked,
damped



→ from
page 171

			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

[*]		
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1
		
≤ 1200		–
> 1200		1

Weight-dependent components

[*] Load transfer set; S.kg > 100 kg

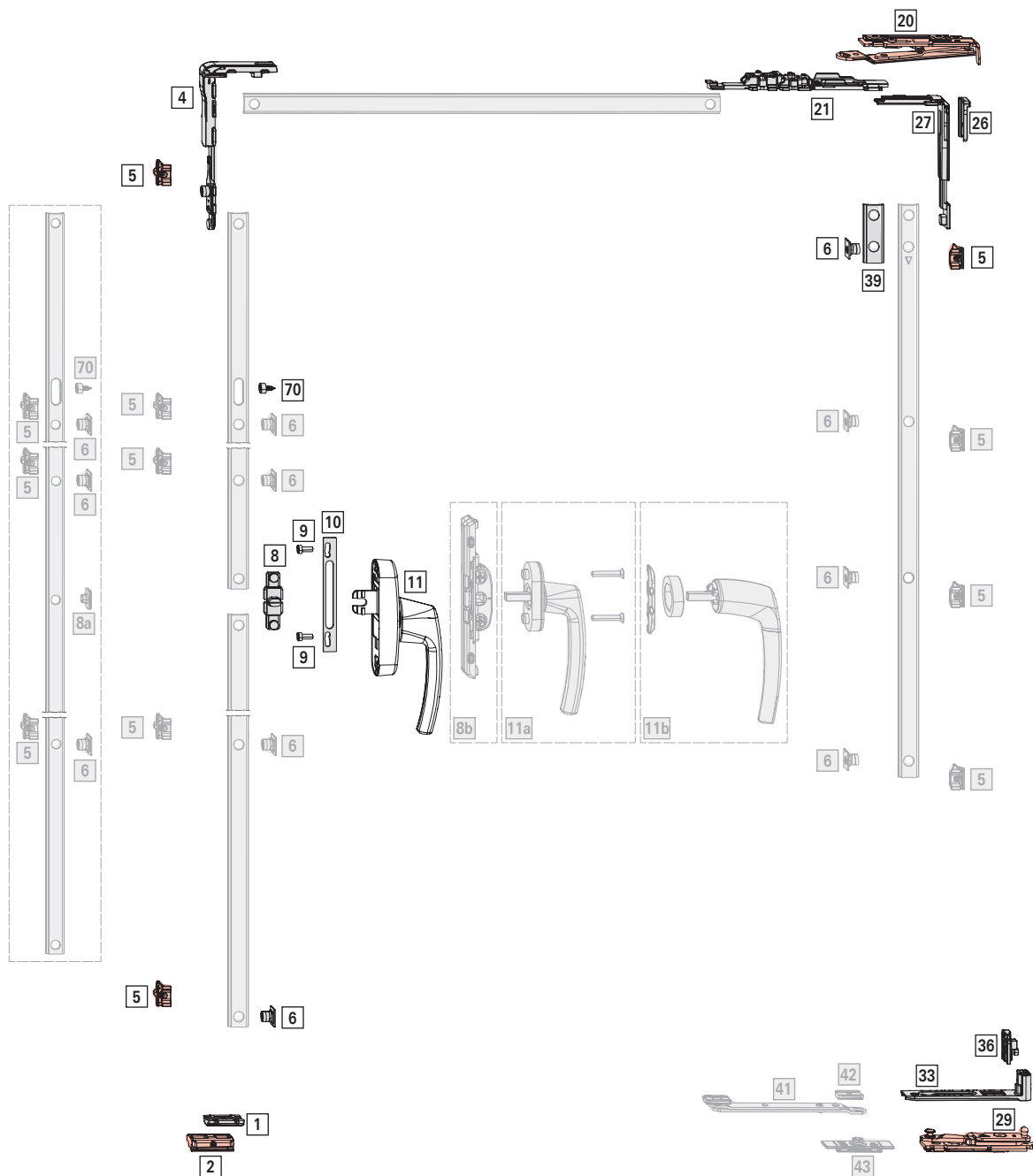
			Nº
V.01	Left	10 Piece(s)	739694
	Right	10 Piece(s)	739693
V.02	Left	10 Piece(s)	739696
	Right	10 Piece(s)	739695

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1

4.3 Turn-Only hardware

4.3.1 T-O rebate sash stay, couplable | 80 kg





Application range

SW: 300 – 900 mm

SH: 520 – 3000 mm

S.kg: max. 80 kg



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[*] T-O locking components set; for rebate sash stay, couplable

		Nº
V.01	10 Piece(s)	740848
V.02	10 Piece(s)	740849

Contents:

[*]		#
[1]	Run-up block	1
[2]	Tilt striker	1
[4]	Corner drive without blocking device, with retaining fork	1
[5]	Striker V.01 / V.02	2
[6]	Cam, insertable	1

[*] Rebate sash stay set; couplable

			Nº
No. 1	Left	10 Piece(s)	740843
	Right	10 Piece(s)	740840
No. 3	Left	10 Piece(s)	740844
	Right	10 Piece(s)	740841
No. 4	Left	10 Piece(s)	740845
	Right	10 Piece(s)	740842

Contents:

[*]		#
[20]	Rebate sash stay, couplable, with clamp strip	1
[21]	Rebate stay hinge, couplable	2
[29]	Pivot rest	1
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] CL corner drive set Large packages

		Nº
V.01	20 Piece(s)	728842
V.02	20 Piece(s)	728843

Contents:

[*]		#
[5]	Striker V.01 / V.02	2
[6]	Cam, insertable	2
[26]	Retaining fork	1
[27]	CL corner drive	1

[70] Locking sleeve

			Nº
Locking sleeve	Blocks the movement of the espagnolette (90°)	100 Piece(s)	738549

[39] Connecting rod, fixed, vertical (CR4)

→ from page 165

Espagnolette and connector

[*] T connector set

Alternatively:

[8a]	Connector bolt, insertable 	1	→ from page 162
[8b]	Flush-encased gearbox 	1	→ from page 163

		Nº
AL T connector set	10 Piece(s)	728981

Contents:

[*]		
[8]	T connector	1
[9]	Cylinder screw M5 x 12	2

[10] Espagnolette support

				Nº
Espagnolette support	For Roto Line AL geared-handle	13.5	100 Piece(s)	331937

[11] Roto Line window handle – geared-handle

→ CTL_1

Alternatively:

[a]	Roto Line window handle – stand-ard 	1	→ CTL_1
	Countersunk screw M5 x 30 	2	
[b]	Roto Line window handle – handle without escutcheon 	1	→ CTL_1
	Ring for handle without escutcheon 	1	
	Mounting plate 	1	

Hardware overviews

Turn-Only hardware

T-O rebate sash stay, couplable | 80 kg

Height-dependent components

[5] Striker			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

	
≤ 1300	–
1301 – 1800	1
1801 – 2400	3
> 2400	5

[6] Cam, insertable		
		Nº
Insertable	100 Piece(s)	334671

	
≤ 1300	–
1301 – 1800	1
1801 – 2400	3
> 2400	5

Optional

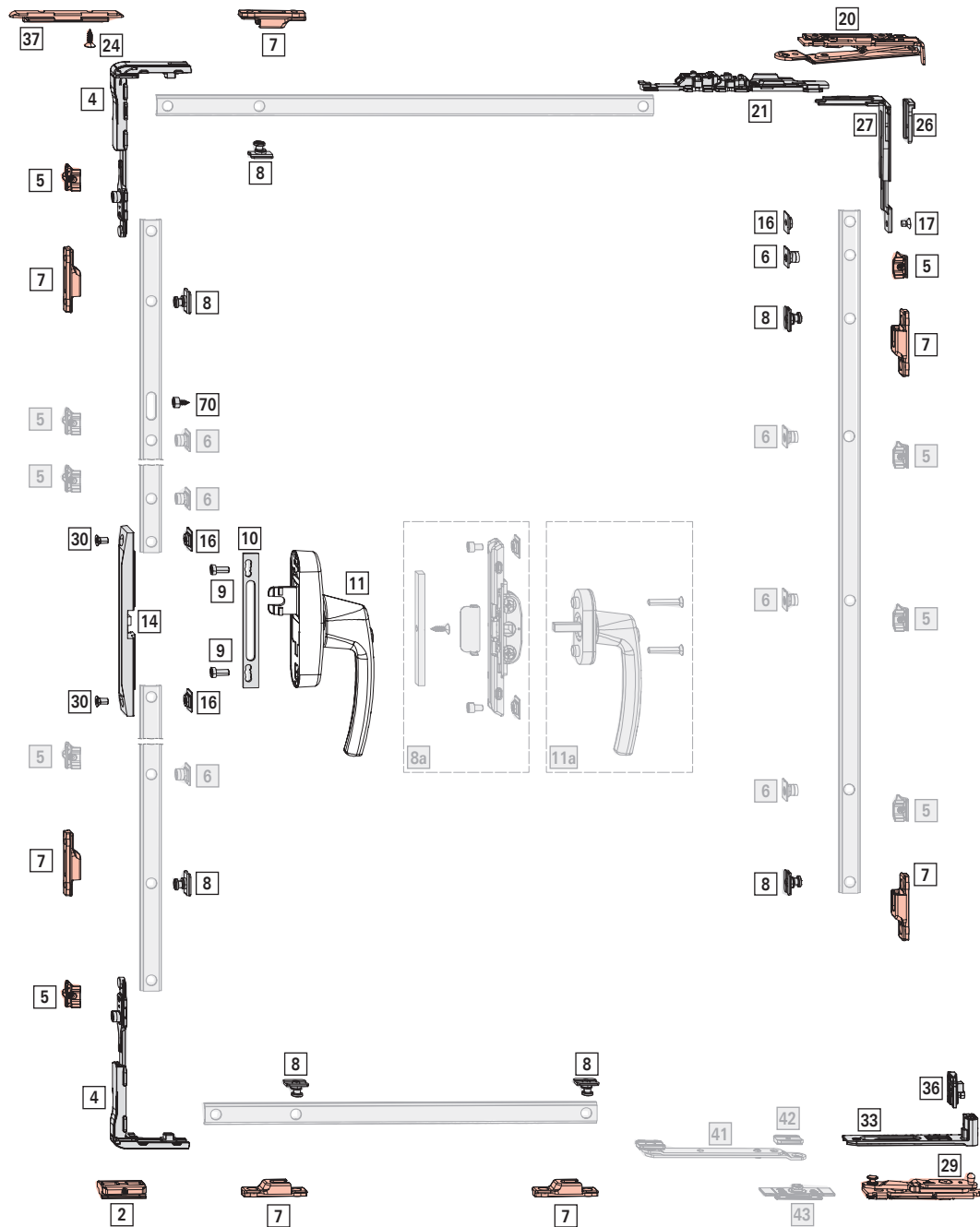
[*] Turn restrictor set, with stop 			
Alternatively:			
Turn restrictor set, braked, damped		 1	→ from page 171
			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

[*]		
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1



4.3.2 T-O rebate sash stay, couplable | RC 2 | 80 kg



**Application range****SW:** 370 – 900 mm**SH:** 720 – 3000 mm**S.kg:** max. 80 kg**INFO**

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set
[*] T-O locking components set; for rebate sash stay, couplable 1

		Nº
V.01	10 Piece(s)	740848
V.02	10 Piece(s)	740849

Contents:

[*]		#
[1]	Run-up block	1
[2]	Tilt striker	1
[4]	Corner drive without blocking device, with retaining fork	1
[5]	Striker V.01 / V.02	2
[6]	Cam, insertable	1

[*] Rebate sash stay set; couplable 1

		Nº
No. 1	Left	10 Piece(s) 740843
	Right	10 Piece(s) 740840
No. 3	Left	10 Piece(s) 740844
	Right	10 Piece(s) 740841
No. 4	Left	10 Piece(s) 740845
	Right	10 Piece(s) 740842

Contents:

[*]		#
[20]	Rebate sash stay, couplable, with clamp strip	1
[21]	Rebate stay hinge, couplable	2
[29]	Pivot rest	1
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] CL SEC corner drive set 1
Large packages

		Nº
SEC corner drive CL set with retaining fork	10 Piece(s)	728944

Contents:

[*]		#
[16]	SEC connector	1
[17]	Countersunk screw M5 x 7	1
[26]	SEC retaining fork	1
[27]	CL SEC corner drive	1

[*] SEC rebate-clearance reduction set 1
Large packages → from page 166

			Nº
SEC rebate-clearance reduction set	For corner drives	10 Piece(s)	728950

[*]		#
[24]	Countersunk screw ST4.8 x 16	1
[37]	SEC rebate-clearance reduction CD	1

[7] SEC striker 6

		Nº
V.01	9	100 Piece(s) 212637
V.02	9	100 Piece(s) 212638

[8] SEC cam **RC 2** 6

		Nº
Insertable	100 Piece(s)	447245

[5] Striker 1

		Nº
V.01	9	100 Piece(s) 728918
V.02	9	100 Piece(s) 728920

[6] Cam, insertable 1

		Nº
Insertable	100 Piece(s)	334671

[4] Corner drive without blocking device, with retaining fork 1

		Nº
Corner drive without mishandling device, with retaining fork	50 Piece(s)	728844

[70] Locking sleeve 1

			Nº
Locking sleeve	Blocks the movement of the espagnolette (90°)	100 Piece(s)	738549

Espagnolette and connector
[*] SEC espagnolette protection set 1

Large packages
Alternatively:

Hardware overviews

Turn-Only hardware

T-O rebate sash stay, couplable | RC 2 | 80 kg

[8a] SEC flush-encased gearbox set 1 → from page 170

		Nº
SEC espagnolette protection set	10 Piece(s)	728952

Contents:

[*]		#
[14]	SEC espagnolette protection	1
[16]	SEC connector	2
[30]	Countersunk screw M5 x 10	2

[9] Cylinder screw M5 x 12 2

			Nº
Cylinder screw	M5x12	100 Piece(s)	728925

[10] Espagnolette support 1

				Nº
Espagnolette support	For Roto Line AL geared-handle	13.5	100 Piece(s)	331937

[11] Roto Line window handle – geared-handle, lockable 1

Alternatively:

[a]	Roto Line window handle, lockable	 1	→ CTL_1
	Countersunk screw M5 x 30	 2	

Height-dependent components

[5] Striker

			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

	
≤ 1300	–
1301 – 1800	2
1801 – 2400	4
> 2400	6

[6] Cam, insertable

		Nº
Insertable	100 Piece(s)	334671

	
≤ 1300	–
1301 – 1800	2
1801 – 2400	4
> 2400	6

Width-dependent components

[7] SEC striker

			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638

	
≤ 500	–
> 500	1

[8] SEC cam RC 2

		Nº
Insertable	100 Piece(s)	447245

	
≤ 500	–
> 500	1

Optional

[*] Turn restrictor set, with stop 1

Alternatively:

Turn restrictor set, braked,  1 → from page 171

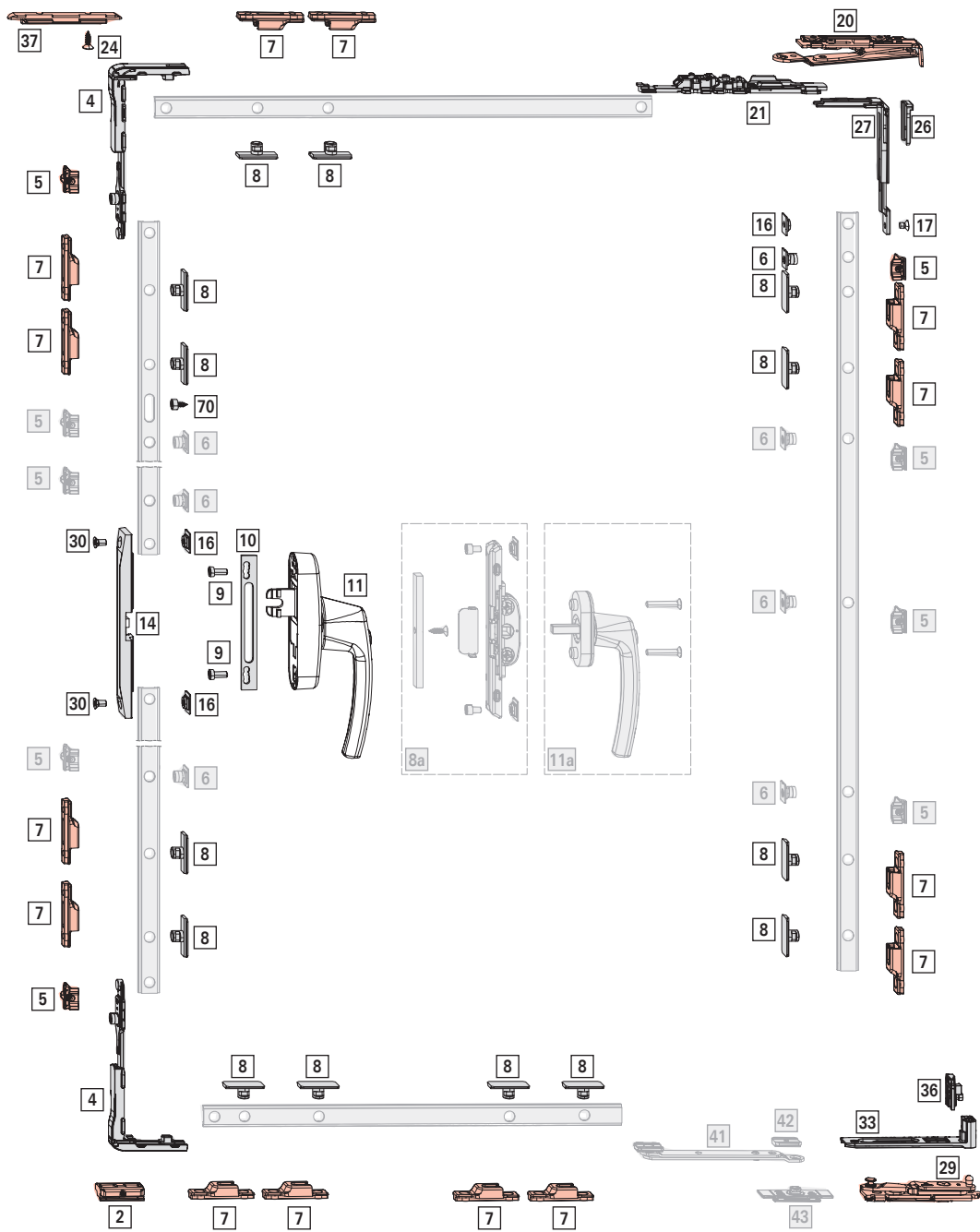
			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

[*]		
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1



4.3.3 T-O rebate sash stay, couplable | RC 3 | 80 kg





Application range

SW: 485 – 900 mm

SH: 870 – 3000 mm

S.kg: max. 80 kg



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[*] T-O locking components set; for rebate sash stay, couplable

		Nº
V.01	10 Piece(s)	740848
V.02	10 Piece(s)	740849

Contents:

[*]		#
[1]	Run-up block	1
[2]	Tilt striker	1
[4]	Corner drive without blocking device, with retaining fork	1
[5]	Striker V.01 / V.02	2
[6]	Cam, insertable	1

[*] Rebate sash stay set; couplable

			Nº
No. 1	Left	10 Piece(s)	740843
	Right	10 Piece(s)	740840
No. 3	Left	10 Piece(s)	740844
	Right	10 Piece(s)	740841
No. 4	Left	10 Piece(s)	740845
	Right	10 Piece(s)	740842

Contents:

[*]		#
[20]	Rebate sash stay, couplable, with clamp strip	1
[21]	Rebate stay hinge, couplable	2
[29]	Pivot rest	1
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] CL SEC corner drive set

Large packages

		Nº
SEC corner drive CL set with retaining fork	10 Piece(s)	728944

Contents:

[*]		#
[16]	SEC connector	1
[17]	Countersunk screw M5 x 7	1
[26]	SEC retaining fork	1
[27]	CL SEC corner drive	1

[*] SEC rebate-clearance reduction set

Large packages → from page 166

			Nº
SEC rebate-clearance reduction set	For corner drives	10 Piece(s)	728950

[*]		#
[24]	Countersunk screw ST4.8 x 16	1
[37]	SEC rebate-clearance reduction CD	1

[7] SEC striker

			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638

[8] SEC cam RC 3

		Nº
Insertable	100 Piece(s)	443530

[5] Striker

			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

[6] Cam, insertable

		Nº
Insertable	100 Piece(s)	334671

[4] Corner drive without blocking device, with retaining fork

		Nº
Corner drive without mishandling device, with retaining fork	50 Piece(s)	728844

[70] Locking sleeve

			Nº
Locking sleeve	Blocks the movement of the espagnolette (90°)	100 Piece(s)	738549

Espagnolette and connector

[*] SEC espagnolette protection set

Large packages

Hardware overviews

Turn-Only hardware

T-O rebate sash stay, couplable | RC 3 | 80 kg

Alternatively:
[8a] SEC flush-encased gearbox set  1 → *from page 170*

		Nº
SEC espagnolette protection set	10 Piece(s)	728952

Contents:

[*]		#
[14]	SEC espagnolette protection	1
[16]	SEC connector	2
[30]	Countersunk screw M5 x 10	2

[9] Cylinder screw M5 x 12

			Nº
Cylinder screw	M5x12	100 Piece(s)	728925

[10] Espagnolette support

				Nº
Espagnolette support	For Roto Line AL geared-handle	13.5	100 Piece(s)	331937

[11] Roto Line window handle – geared-handle, lockable

	Alternatively:	→ CTL_1
[a]	Roto Line window handle, lockable	 1 → CTL_1
	Countersunk screw M5 x 30	 2

Height-dependent components

[5] Striker

			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

	
≤ 1300	–
1301 – 1800	2
1801 – 2400	4
> 2400	6

[6] Cam, insertable

		Nº
Insertable	100 Piece(s)	334671

	
≤ 1300	–
1301 – 1800	2
1801 – 2400	4
> 2400	6

Width-dependent components

[7] SEC striker

			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638

	
≤ 500	–
> 500	2

[8] SEC cam RC 3

		Nº
Insertable	100 Piece(s)	443530

	
≤ 500	–
> 500	2

Optional

[*] Turn restrictor set, with stop

Alternatively:
Turn restrictor set, braked,  1 → *from page 171*
damped

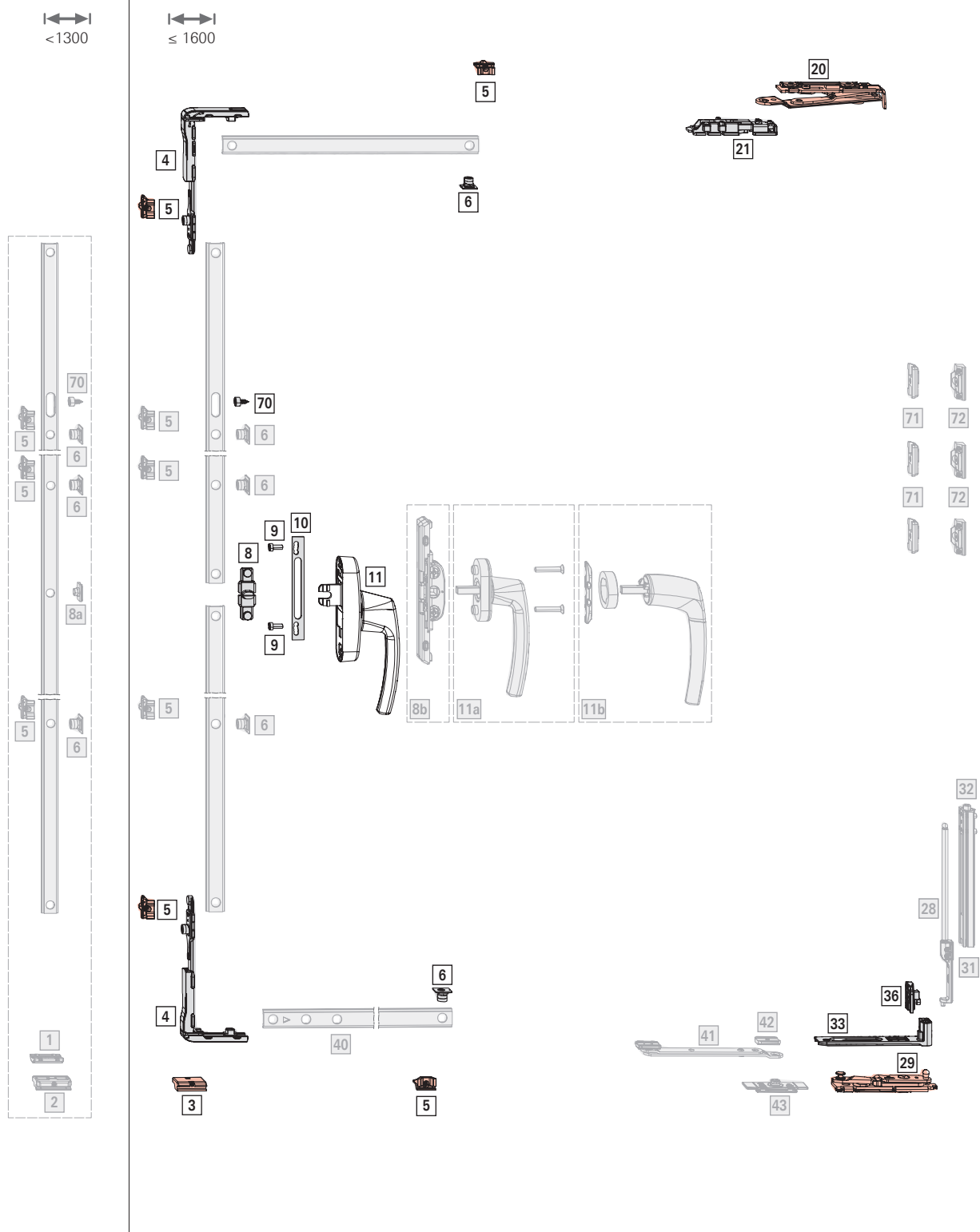
			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

[*]		
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1



4.3.4 T-O | 150 kg





Application range

SW: 250 – 1600 mm

SH: 520 – 3000 mm

S.kg: max. 150 kg



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest with clamp strip



			Nº
No. 1	Left	10 Piece(s)	624970
	Right	10 Piece(s)	624969
No. 3	Left	10 Piece(s)	624972
	Right	10 Piece(s)	624971
No. 4	Left	10 Piece(s)	624974
	Right	10 Piece(s)	624973

[*] Corner hinge set



			Nº
Left		10 Piece(s)	739700
Right		10 Piece(s)	739699

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] T-O locking components set



		Nº
V.01	10 Piece(s)	728743
V.02	10 Piece(s)	728744

[*]

[3]	Run-up wedge V.01 / V.02	1
[4]	Corner drive without blocking device, with retaining fork	2
[5]	Striker V.01 / V.02	4
[6]	Cam, insertable	2

[*] Alternatively: T-O locking components set; SW < 1300 mm



		Nº
V.01	10 Piece(s)	728756
V.02	10 Piece(s)	728757

Contents:

[*]		#
[1]	Run-up block	1
[2]	Tilt striker	1
[5]	Striker V.01 / V.02	2
[6]	Cam, insertable	2

[20] Rebate sash stay with clamp strip



			Nº
No. 1	Left	10 Piece(s)	627256
	Right	10 Piece(s)	627255
No. 3	Left	10 Piece(s)	627258
	Right	10 Piece(s)	627257
No. 4	Left	10 Piece(s)	627260
	Right	10 Piece(s)	627259

[21] Rebate stay hinge



		Nº
10 Piece(s)		740811

[5] Striker



			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

[6] Cam, insertable



		Nº
Insertable	100 Piece(s)	334671

[70] Locking sleeve



			Nº
Locking sleeve	Blocks the movement of the espagnolette (90°)	100 Piece(s)	738549

Espagnolette and connector

[*] T connector set



Alternatively:

[8a]	Connector bolt, insertable	1	→ from page 162
[8b]	Flush-encased gearbox	1	→ from page 163

		Nº
AL T connector set	10 Piece(s)	728981

Contents:

[*]		
[8]	T connector	1
[9]	Cylinder screw M5 x 12	2

[10] Espagnolette support				1
				Nº
Espagnolette support	For Roto Line AL geared-handle	13.5	100 Piece(s)	331937

[11] Roto Line window handle – geared-handle				1
Alternatively:				→ CTL_1
[a]	Roto Line window handle – standard		1	→ CTL_1
	Countersunk screw M5 x 30		2	
[b]	Roto Line window handle – handle without escutcheon		1	→ CTL_1
	Ring for handle without escutcheon		1	
	Mounting plate		1	

Height-dependent components

[5] Striker				Nº
V.01	9	100 Piece(s)		728918
V.02	9	100 Piece(s)		728920

≤ 1300	–
1301 – 1800	1
1801 – 2400	2
> 2400	3

[6] Cam, insertable				Nº
Insertable	100 Piece(s)			334671

≤ 1300	–
1301 – 1800	1
1801 – 2400	2
> 2400	3

[*] CL set				Nº
V.01	10 Piece(s)			740813
V.02	10 Piece(s)			740812

Contents:

[*]		#
[71]	CL sash component	1
[72]	CL frame component V.01 / V.02	1

≤ 1300	–
1301 – 1800	1
1801 – 2400	2
> 2400	3

Width-dependent components

[*] Turn restrictor set, with stop				1
Alternatively:				
Turn restrictor set, braked, damped				→ from page 171

			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

[*]		#
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1

≤ 1200	–
> 1200	1

[40] Connecting rod, fixed, horizontal, bottom (CR5)			
→ from page 165			

Weight-dependent components

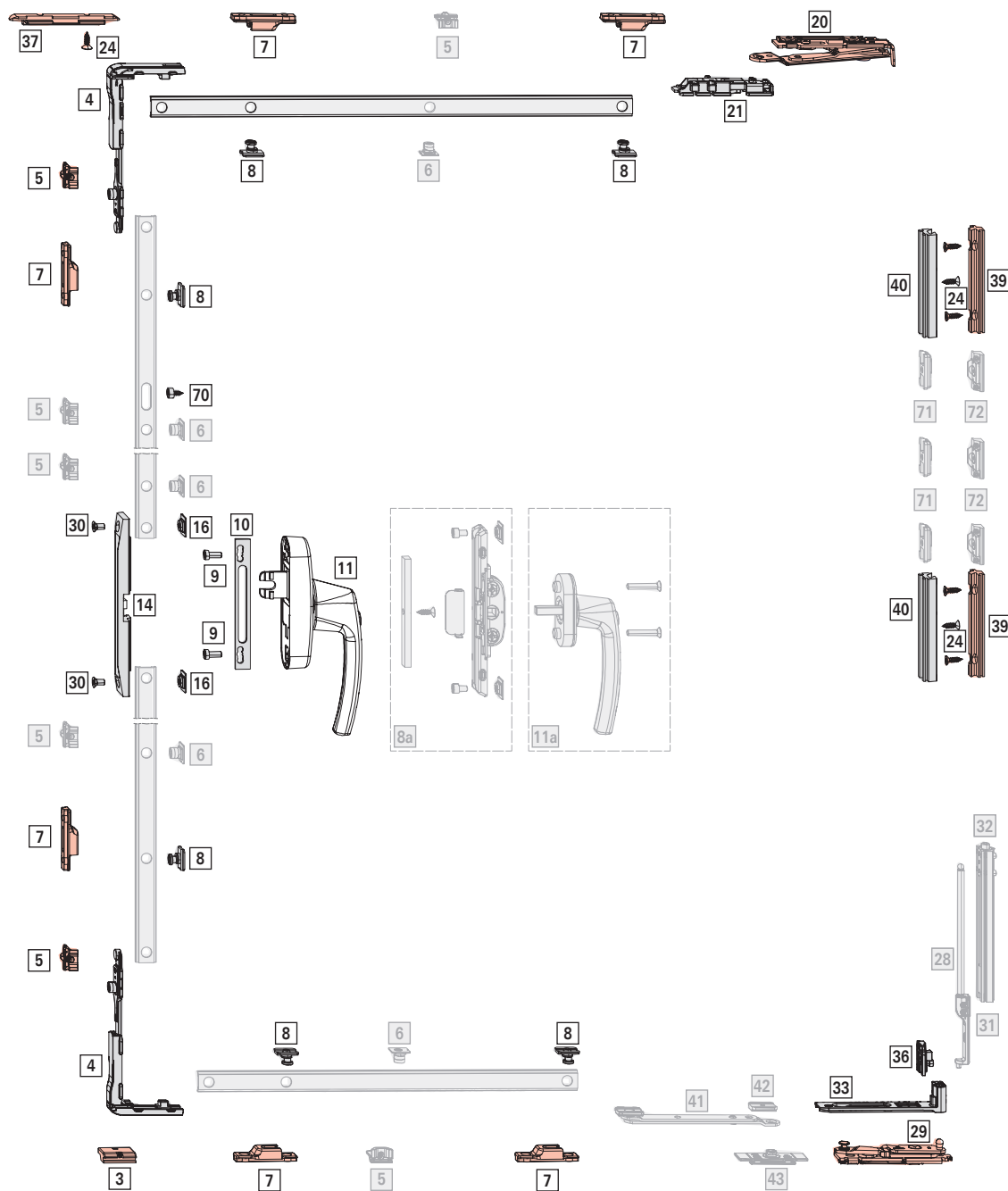
[*] Load transfer set; S.kg > 80 kg				1
				Nº
V.01	Left	10 Piece(s)		739694
	Right	10 Piece(s)		739693
V.02	Left	10 Piece(s)		739696
	Right	10 Piece(s)		739695

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1



4.3.5 T-O | RC 2 | 150 kg





Application range

SW: 530 – 1600 mm

SH: 720 – 3000 mm

S.kg: max. 150 kg



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest with clamp strip

				Nº
No. 1	Left	10 Piece(s)	624970	
	Right	10 Piece(s)	624969	
No. 3	Left	10 Piece(s)	624972	
	Right	10 Piece(s)	624971	
No. 4	Left	10 Piece(s)	624974	
	Right	10 Piece(s)	624973	

[*] Corner hinge set

			Nº
Left	10 Piece(s)	739700	
Right	10 Piece(s)	739699	

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] T-O locking components set

			Nº
V.01	10 Piece(s)	728743	
V.02	10 Piece(s)	728744	

[*]		
[3]	Run-up wedge V.01 / V.02	1
[4]	Corner drive without blocking device, with retaining fork	2
[5]	Striker V.01 / V.02	4
[6]	Cam, insertable	2

[20] Rebate sash stay with clamp strip

				Nº
No. 1	Left	10 Piece(s)	627256	
	Right	10 Piece(s)	627255	
No. 3	Left	10 Piece(s)	627258	
	Right	10 Piece(s)	627257	
No. 4	Left	10 Piece(s)	627260	
	Right	10 Piece(s)	627259	

[21] Rebate stay hinge

		Nº
10 Piece(s)	740811	

[*] SEC hinge lock set

			Nº
V.01	10 Piece(s)	728940	
V.02	10 Piece(s)	728941	

Contents:

[*]		#
[24]	Countersunk screw ST4.8 x 16	3
[39]	Frame component V.01 / V.02	1
[40]	Sash component	1

[*] SEC rebate-clearance reduction set

Large packages → *from page 166*

				Nº
SEC rebate-clearance reduction set	For corner drives	10 Piece(s)	728950	

[*]		#
[24]	Countersunk screw ST4.8 x 16	1
[37]	SEC rebate-clearance reduction CD	1

[7] SEC striker

				Nº
V.01	9	100 Piece(s)	212637	
V.02	9	100 Piece(s)	212638	

[8] SEC cam **RC 2**

			Nº
Insertable	100 Piece(s)	447245	

[70] Locking sleeve

				Nº
Locking sleeve	Blocks the movement of the espagnolette (90°)	100 Piece(s)	738549	

Espagnolette and connector

[*] SEC espagnolette protection set

Large packages

Alternatively:

[8a]	SEC flush-encased gearbox set 	→ <i>from page 170</i>
------	---	------------------------

			Nº
SEC espagnolette protection set	10 Piece(s)	728952	

Contents:

[*]		#
[14]	SEC espagnolette protection	1
[16]	SEC connector	2
[30]	Countersunk screw M5 x 10	2

[9]	Cylinder screw M5 x 12			2
			Nº	
Cylinder screw	M5x12	100 Piece(s)	728925	

[10]	Espagnolette support			1
			Nº	
Espagnolette support	For Roto Line AL geared-handle	13.5 100 Piece(s)	331937	

[11]	Roto Line window handle – geared-handle, lockable			1
			→ CTL_1	
Alternatively:				
[a]	Roto Line window handle, lockable	1	→ CTL_1	
	Countersunk screw M5 x 30	2		

Height-dependent components

[5]	Striker			
			Nº	
V.01	9	100 Piece(s)	728918	
V.02	9	100 Piece(s)	728920	

≤ 1300				–
1301 – 1800				1
1801 – 2400				2
> 2400				3

[6]	Cam, insertable			
			Nº	
Insertable		100 Piece(s)	334671	

≤ 1300				–
1301 – 1800				1
1801 – 2400				2
> 2400				3

[*]	CL set			
			Nº	
V.01		10 Piece(s)	740813	
V.02		10 Piece(s)	740812	

Contents:

[*]		#
[71]	CL sash component	1
[72]	CL frame component V.01 / V.02	1

≤ 1300				–
1301 – 1800				1
1801 – 2400				2
> 2400				3

Width-dependent components

[5]	Striker			
			Nº	
V.01	9	100 Piece(s)	728918	
V.02	9	100 Piece(s)	728920	

≤ 1300				–
> 1300				2

[6]	Cam, insertable			
			Nº	
Insertable		100 Piece(s)	334671	

≤ 1300				–
> 1300				2

[*]	Turn restrictor set, with stop			1
Alternatively:				
	Turn restrictor set, braked,	1	→ from page 171	

			Nº	
Clampable	V.01	10 Piece(s)	2004506	
	V.02	10 Piece(s)	2027613	

Contents:

[*]		#
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1

≤ 1200				–
> 1200				1



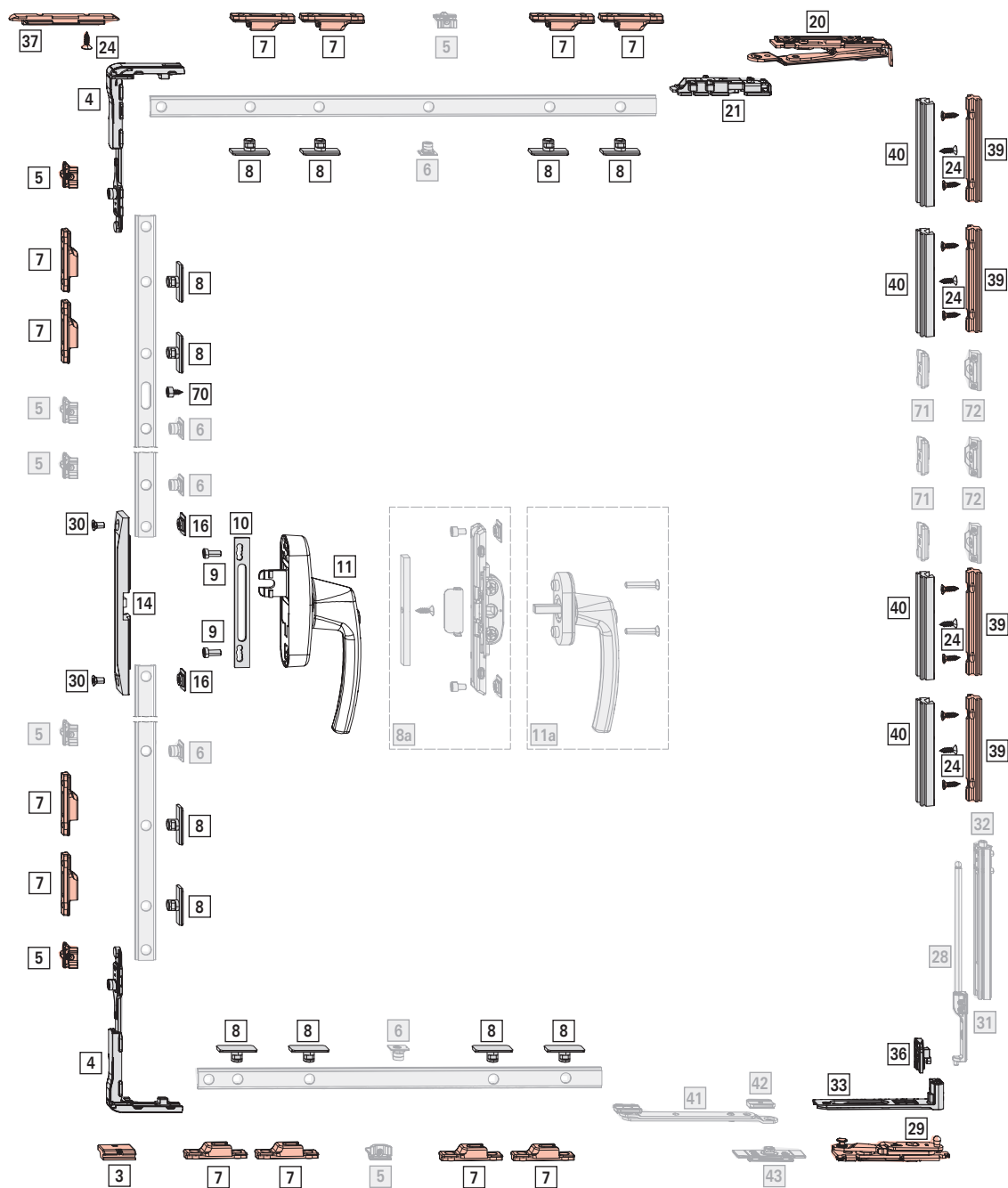
Weight-dependent components

[*] Load transfer set; S.kg > 80 kg 			
			Nº
V.01	Left	10 Piece(s)	739694
	Right	10 Piece(s)	739693
V.02	Left	10 Piece(s)	739696
	Right	10 Piece(s)	739695

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1

4.3.6 T-O | RC 3 | 150 kg





Application range

SW: 680 – 1600 mm

SH: 1050 – 3000 mm

S.kg: max. 150 kg



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest with clamp strip 			
			Nº
No. 1	Left	10 Piece(s)	624970
	Right	10 Piece(s)	624969
No. 3	Left	10 Piece(s)	624972
	Right	10 Piece(s)	624971
No. 4	Left	10 Piece(s)	624974
	Right	10 Piece(s)	624973

[*] Corner hinge set 			
			Nº
Left	10 Piece(s)		739700
Right	10 Piece(s)		739699

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] T-O locking components set 			
			Nº
V.01	10 Piece(s)		728743
V.02	10 Piece(s)		728744

[*]		
[3]	Run-up wedge V.01 / V.02	1
[4]	Corner drive without blocking device, with retaining fork	2
[5]	Striker V.01 / V.02	4
[6]	Cam, insertable	2

[20] Rebate sash stay with clamp strip 			
			Nº
No. 1	Left	10 Piece(s)	627256
	Right	10 Piece(s)	627255
No. 3	Left	10 Piece(s)	627258
	Right	10 Piece(s)	627257
No. 4	Left	10 Piece(s)	627260
	Right	10 Piece(s)	627259

[21] Rebate stay hinge 		
		Nº
10 Piece(s)		740811

[*] SEC hinge lock set 		
		Nº
V.01	10 Piece(s)	728940
V.02	10 Piece(s)	728941

Contents:

[*]		#
[24]	Countersunk screw ST4.8 x 16	3
[39]	Frame component V.01 / V.02	1
[40]	Sash component	1

[*] SEC rebate-clearance reduction set 			
Large packages → <i>from page 166</i>			
			Nº
SEC rebate-clearance reduction set	For corner drives	10 Piece(s)	728950

[*]		#
[24]	Countersunk screw ST4.8 x 16	1
[37]	SEC rebate-clearance reduction CD	1

[7] SEC striker 			
			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638

[8] SEC cam RC 3 		
		Nº
Insertable	100 Piece(s)	443530

[70] Locking sleeve 			
			Nº
Locking sleeve	Blocks the movement of the espagnolette (90°)	100 Piece(s)	738549

Espagnolette and connector

[*] SEC espagnolette protection set 			
Large packages			
Alternatively:			
[8a]	SEC flush-encased gearbox set 	1	→ <i>from page 170</i>
		Nº	
SEC espagnolette protection set	10 Piece(s)	728952	

Contents:

[*]		#
[14]	SEC espagnolette protection	1
[16]	SEC connector	2
[30]	Countersunk screw M5 x 10	2

[9]	Cylinder screw M5 x 12			2
			Nº	
Cylinder screw	M5x12	100 Piece(s)	728925	

[10]	Espagnolette support			1
			Nº	
Espagnolette support	For Roto Line AL geared-handle	13.5 100 Piece(s)	331937	

[11]	Roto Line window handle – geared-handle, lockable			1
			→ CTL_1	
Alternatively:				
[a]	Roto Line window handle, lockable	1	→ CTL_1	
	Countersunk screw M5 x 30	2		

Height-dependent components

[5]	Striker			
			Nº	
V.01	9	100 Piece(s)	728918	
V.02	9	100 Piece(s)	728920	

≤ 1300				–
1301 – 1800				1
1801 – 2400				2
> 2400				3

[6]	Cam, insertable			
			Nº	
Insertable	100 Piece(s)	334671		

≤ 1300				–
1301 – 1800				1
1801 – 2400				2
> 2400				3

[*]	CL set			
			Nº	
V.01	10 Piece(s)	740813		
V.02	10 Piece(s)	740812		

Contents:

[*]		#
[71]	CL sash component	1
[72]	CL frame component V.01 / V.02	1

≤ 1300				–
1301 – 1800				1
1801 – 2400				2
> 2400				3

Width-dependent components

[5]	Striker			
			Nº	
V.01	9	100 Piece(s)	728918	
V.02	9	100 Piece(s)	728920	

≤ 1300				–
> 1300				2

[6]	Cam, insertable			
			Nº	
Insertable	100 Piece(s)	334671		

≤ 1300				–
> 1300				2

[*]	Turn restrictor set, with stop			1
Alternatively:				
	Turn restrictor set, braked,	1	→ from page 171	

			Nº	
Clampable	V.01	10 Piece(s)	2004506	
	V.02	10 Piece(s)	2027613	

Contents:

[*]		#
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1

≤ 1200				–
> 1200				1



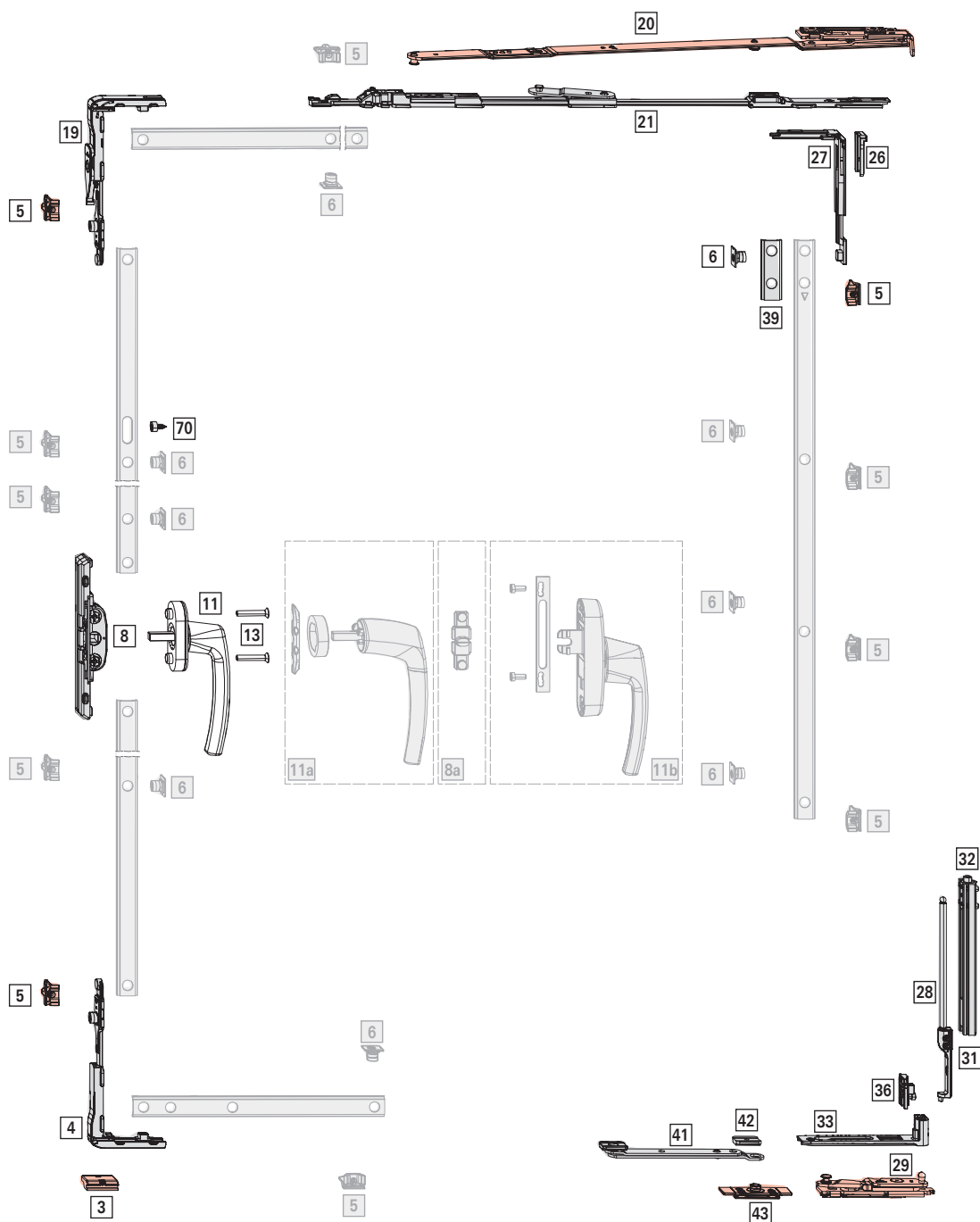
Weight-dependent components

[*] Load transfer set; S.kg > 80 kg 			
			Nº
V.01	Left	10 Piece(s)	739694
	Right	10 Piece(s)	739693
V.02	Left	10 Piece(s)	739696
	Right	10 Piece(s)	739695

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1

4.3.7 T-O | 180 kg





Application range

SW: 735 – 1600 mm

SH: 1000 – 3000 mm

S.kg: max. 180 kg



DANGER

Risk of death due to insufficient profile stability!

Insufficient profile stability may cause the sash to fall and cause serious or fatal accidents.

1. The hardware configuration must be checked separately.
For S.kg 150 - 180 kg, only profiles with a profile assessment that has been approved by Roto are permissible.



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest 180 kg with clamp strip

			Nº
No. 1	Left	10 Piece(s)	641328
	Right	10 Piece(s)	641327
No. 3	Left	10 Piece(s)	641326
	Right	10 Piece(s)	641325
No. 4	Left	10 Piece(s)	641330
	Right	10 Piece(s)	641329

[*] Corner hinge set 180 kg

		Nº
Left	10 Piece(s)	641334
Right	10 Piece(s)	641297

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[3] Run-up wedge

			Nº
Run-up wedge	V.01	100 Piece(s)	684282
	V.02	100 Piece(s)	684283

[4] Corner drive without blocking device, with retaining fork

		Nº
Corner drive without mishandling device, with retaining fork	50 Piece(s)	728844

[5] Striker

			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

[19] Corner drive with blocking device with retaining fork

		Nº
Corner drive with mishandling device and retaining fork	100 Piece(s)	490173

[21] Scissor stay guide

		Nº
735	10 Piece(s)	740838

[20] Sash stay 180 kg

					Nº
735	No. 1	150	Left	10 Piece(s)	641318
		150	Right	10 Piece(s)	641317
	No. 3	150	Left	10 Piece(s)	641320
		150	Right	10 Piece(s)	641319
	No. 4	150	Left	10 Piece(s)	641322
		150	Right	10 Piece(s)	641321

[*] CL corner drive set

Large packages

		Nº
V.01	20 Piece(s)	728842
V.02	20 Piece(s)	728843

Contents:

[*]		#
[5]	Striker V.01 / V.02	2
[6]	Cam, insertable	2
[26]	Retaining fork	1
[27]	CL corner drive	1

[*] Turn restrictor set, with stop

Alternatively:

Turn restrictor set, braked,  1  from page 171

			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

[*]		
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1

[*] Load transfer set				
				Nº
V.01	Left	10 Piece(s)		739694
	Right	10 Piece(s)		739693
V.02	Left	10 Piece(s)		739696
	Right	10 Piece(s)		739695

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1

[70] Locking sleeve				
				Nº
Locking sleeve	Blocks the movement of the espagnolette (90°)	100 Piece(s)		738549

[39] Connecting rod, fixed, vertical (CR4)				
→ from page 165				

Espagnolette and connector

[8] Flush-encased gearbox without mishandling device				
Alternatively: T connector				→ from page 162
				Nº
Flush-encased gearbox without mishandling device		10 Piece(s)		378338

[11] Roto Line window handle – standard				
Alternatively:				→ CTL_1
[a]	Roto Line window handle – handle without escutcheon		1	→ CTL_1
	Ring for handle without escutcheon		1	
	Mounting plate		1	

[b]	Roto Line window handle – geared-handle		1	→ CTL_1
	Espagnolette support		1	→ from page 162
	Cylinder screw M5 x 12		2	→ from page 167

[13] Countersunk screw M5 x 30				
				Nº
Countersunk screw	M5x30	100 Piece(s)		212501

Height-dependent components

[5] Striker				
				Nº
V.01	9	100 Piece(s)		728918
V.02	9	100 Piece(s)		728920
≤ 1300				–
1301 – 1800				2
1801 – 2400				4
> 2400				6

[6] Cam, insertable				
				Nº
Insertable		100 Piece(s)		334671
≤ 1300				–
1301 – 1800				1
1801 – 2400				3
> 2400				5

Width-dependent components

[5] Striker				
				Nº
V.01	9	100 Piece(s)		728918
V.02	9	100 Piece(s)		728920
≤ 1300				–
> 1300				2

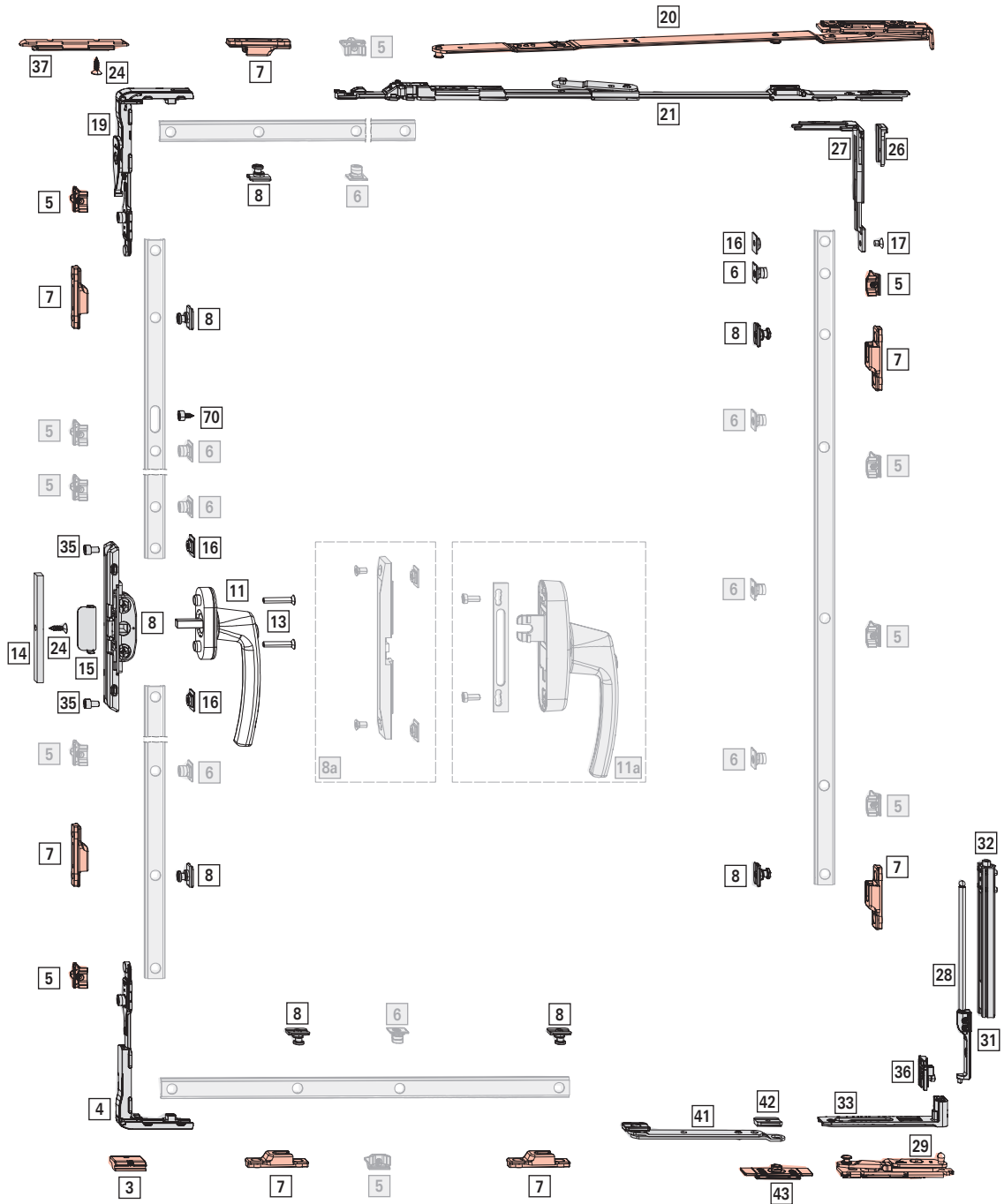
[6] Cam, insertable				
				Nº
Insertable		100 Piece(s)		334671
≤ 1300				–
> 1300				2



[40] Connecting rod, fixed, horizontal, bottom
(CR5)

→ *from page 165*

4.3.8 T-O | RC 2 | 180 kg





Application range

SW: 800 – 1600 mm

SH: 1000 – 3000 mm

S.kg: max. 180 kg



DANGER

Risk of death due to insufficient profile stability!

Insufficient profile stability may cause the sash to fall and cause serious or fatal accidents.

1. The hardware configuration must be checked separately.

For S.kg 150 - 180 kg, only profiles with a profile assessment that has been approved by Roto are permissible.



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest 180 kg with clamp strip

				Nº
No. 1	Left		10 Piece(s)	641328
	Right		10 Piece(s)	641327
No. 3	Left		10 Piece(s)	641326
	Right		10 Piece(s)	641325
No. 4	Left		10 Piece(s)	641330
	Right		10 Piece(s)	641329

[*] Corner hinge set 180 kg

			Nº
Left		10 Piece(s)	641334
Right		10 Piece(s)	641297

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[3] Run-up wedge

				Nº
Run-up wedge	V.01		100 Piece(s)	684282
	V.02		100 Piece(s)	684283

[4] Corner drive without blocking device, with retaining fork

			Nº
Corner drive without mishandling device, with retaining fork		50 Piece(s)	728844

[5] Striker

				Nº
V.01	9		100 Piece(s)	728918
V.02	9		100 Piece(s)	728920

[6] Cam, insertable

			Nº
Insertable		100 Piece(s)	334671

[19] Corner drive with blocking device with retaining fork

			Nº
Corner drive with mishandling device and retaining fork		100 Piece(s)	490173

[21] Scissor stay guide

			Nº
735		10 Piece(s)	740838

[20] Sash stay 180 kg

						Nº
735	No. 1	150	Left		10 Piece(s)	641318
		150	Right		10 Piece(s)	641317
	No. 3	150	Left		10 Piece(s)	641320
		150	Right		10 Piece(s)	641319
	No. 4	150	Left		10 Piece(s)	641322
		150	Right		10 Piece(s)	641321

[*] CL SEC corner drive set Large packages

			Nº
SEC corner drive CL set with retaining fork		10 Piece(s)	728944

[*]		#
[16]	SEC connector	1
[17]	Countersunk screw M5 x 7	1
[26]	SEC retaining fork	1
[27]	CL SEC corner drive	1

[*] SEC rebate-clearance reduction set

Large packages → from page 166

		Nº
SEC rebate-clearance reduction set	For corner drives	10 Piece(s) 728950

[*]		#
[24]	Countersunk screw ST4.8 x 16	1
[37]	SEC rebate-clearance reduction CD	1

[7] SEC striker 7

			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638

[8] SEC cam **RC 2** 7

		Nº
Insertable	100 Piece(s)	447245

[*] Turn restrictor set, with stop 1

Alternatively:

Turn restrictor set, braked, 1 → from page 171

			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

[*]			#
[41]	Rotating arm, compl.	1	
[42]	Stop	1	
[43]	Bearing, compl.	1	

[*] Load transfer set 1

			Nº
V.01	Left	10 Piece(s)	739694
	Right	10 Piece(s)	739693
V.02	Left	10 Piece(s)	739696
	Right	10 Piece(s)	739695

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1

[70] Locking sleeve 1

		Nº
Locking sleeve	Blocks the movement of the espagnolette (90°)	100 Piece(s) 738549

Espagnolette and connector**[*] SEC flush-encased gearbox set** 1

Large packages

→ from page 163

Alternatively:

[8a] SEC espagnolette protection set 1 → from page 162

		Nº
SEC flush-encased gearbox set	10 Piece(s)	728947

Contents:

[*]		#
[8]	SEC flush-encased gearbox without blocking device	1
[14]	SEC rebate-clearance reduction flush-encased gearbox	1
[15]	SEC drilling protection	1
[16]	SEC connector	2
[24]	Countersunk screw ST4.8 x 16	1
[35]	Cylinder screw M5 x 8	2

[14] SEC rebate-clearance reduction flush-encased gearbox 1

		Nº
SEC rebate-clearance reduction ESP	For Roto Line lock handles	50 Piece(s) 334360

[15] SEC drilling protection 1

		Nº
SEC drilling protection	For Roto Line lock handles	10 Piece(s) 487406

[24] Countersunk screw ST4.8 x 16 1

		Nº
Countersunk screw	ST4,8x16	100 Piece(s) 728933

[11] Roto Line window handle, lockable 1

→ CTL_1

Alternatively:

[a] Roto Line window handle – geared-handle, lockable 1 → CTL_1

Espagnolette support 1 → from page 162

Cylinder screw M5 x 12 2 → from page 167

[13] Countersunk screw M5 x 30 1

		Nº
Countersunk screw	M5x30	100 Piece(s) 212501



Height-dependent components

[5] Striker			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920
			
≤ 1300			–
1301 – 1800			2
1801 – 2400			4
> 2400			6

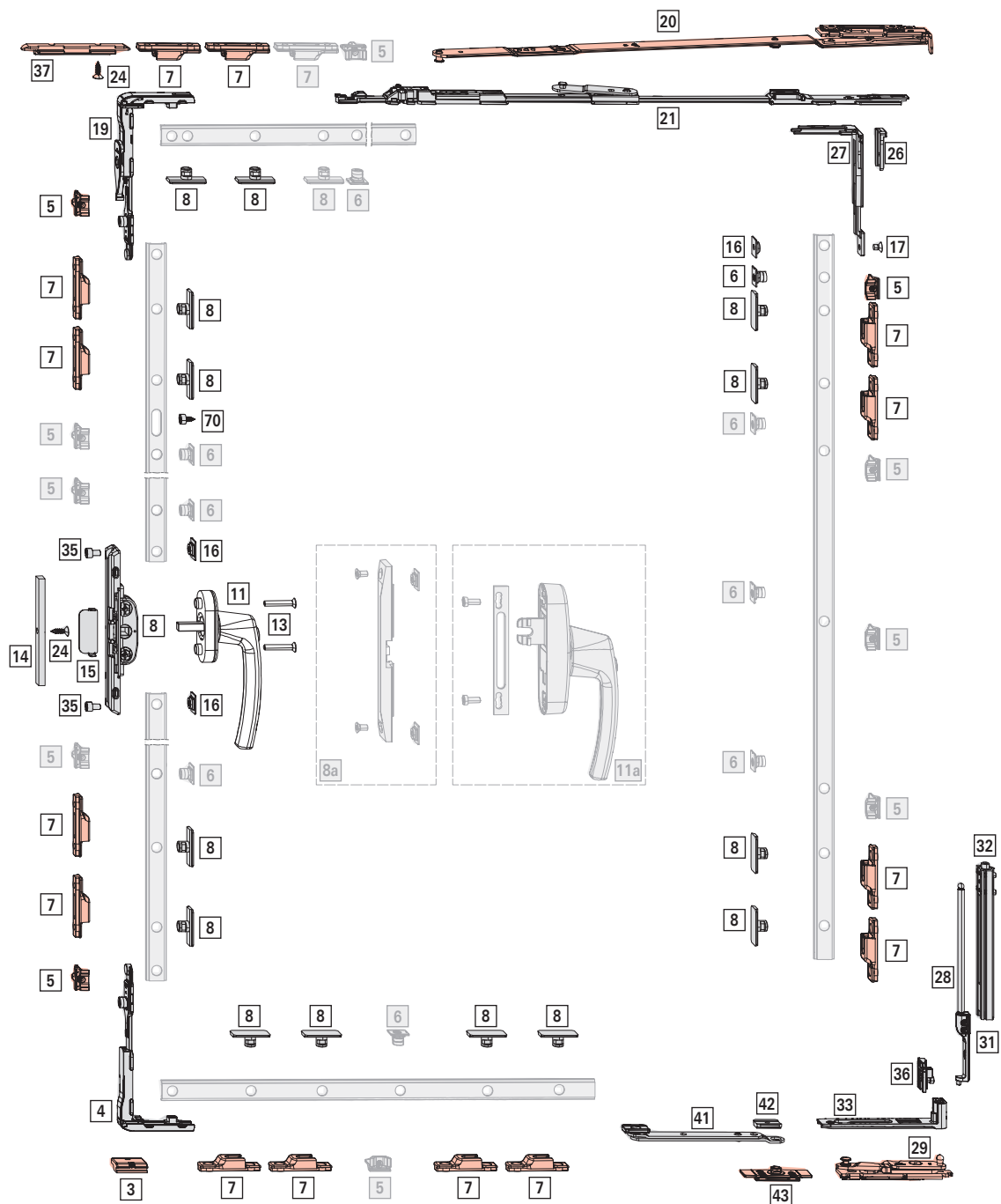
[6] Cam, insertable			
		Nº	
Insertable	100 Piece(s)	334671	
			
≤ 1300			–
1301 – 1800			2
1801 – 2400			4
> 2400			6

Width-dependent components

[5] Striker			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920
			
≤ 1300			–
> 1300			2

[6] Cam, insertable			
		Nº	
Insertable	100 Piece(s)	334671	
			
≤ 1300			–
> 1300			2

4.3.9 T-O | RC 3 | 180 kg





Application range

SW: 915 – 1600 mm

SH: 1000 – 3000 mm

S.kg: max. 180 kg



DANGER

Risk of death due to insufficient profile stability!

Insufficient profile stability may cause the sash to fall and cause serious or fatal accidents.

1. The hardware configuration must be checked separately.

For S.kg 150 - 180 kg, only profiles with a profile assessment that has been approved by Roto are permissible.



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest 180 kg with clamp strip 			
			Nº
No. 1	Left	10 Piece(s)	641328
	Right	10 Piece(s)	641327
No. 3	Left	10 Piece(s)	641326
	Right	10 Piece(s)	641325
No. 4	Left	10 Piece(s)	641330
	Right	10 Piece(s)	641329

[*] Corner hinge set 180 kg 			
		Nº	
Left	10 Piece(s)	641334	
Right	10 Piece(s)	641297	

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[3] Run-up wedge 			
			Nº
Run-up wedge	V.01	100 Piece(s)	684282
	V.02	100 Piece(s)	684283

[4] Corner drive without blocking device, with retaining fork



Nº

Corner drive without mishandling device, with retaining fork 50 Piece(s) 728844

[5] Striker



Nº

V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

[6] Cam, insertable



Nº

Insertable	100 Piece(s)	334671
------------	--------------	--------

[19] Corner drive with blocking device with retaining fork



Nº

Corner drive with mishandling device and retaining fork 100 Piece(s) 490173

[21] Scissor stay guide



Nº

735	10 Piece(s)	740838
-----	-------------	--------

[20] Sash stay 180 kg



Nº

735	No. 1	150	Left	10 Piece(s)	641318
		150	Right	10 Piece(s)	641317
	No. 3	150	Left	10 Piece(s)	641320
		150	Right	10 Piece(s)	641319
	No. 4	150	Left	10 Piece(s)	641322
		150	Right	10 Piece(s)	641321

[*] CL SEC corner drive set

Large packages



Nº

SEC corner drive CL set with retaining fork 10 Piece(s) 728944



#

[16]	SEC connector	1
[17]	Countersunk screw M5 x 7	1
[26]	SEC retaining fork	1
[27]	CL SEC corner drive	1

[*] SEC rebate-clearance reduction set

Large packages → *from page 166*

			Nº
SEC rebate-clearance reduction set	For corner drives	10 Piece(s)	728950

[*]		#
[24]	Countersunk screw ST4.8 x 16	1
[37]	SEC rebate-clearance reduction CD	1

[7] SEC striker

			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638

[8] SEC cam RC 3

		Nº
Insertable	100 Piece(s)	443530

[*] Turn restrictor set, with stop

Alternatively:
Turn restrictor set, braked, damped  1 → *from page 171*

			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

[*]			#
[41]	Rotating arm, compl.	1	
[42]	Stop	1	
[43]	Bearing, compl.	1	

[*] Load transfer set

			Nº
V.01	Left	10 Piece(s)	739694
	Right	10 Piece(s)	739693
V.02	Left	10 Piece(s)	739696
	Right	10 Piece(s)	739695

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1

[70] Locking sleeve

			Nº
Locking sleeve	Blocks the movement of the espagnolette (90°)	100 Piece(s)	738549

Espagnolette and connector

[*] SEC flush-encased gearbox set

Large packages

→ *from page 163*

Alternatively:

[8a] SEC espagnolette protection set 1 → *from page 162*

		Nº
SEC flush-encased gearbox set	10 Piece(s)	728947

Contents:

[*]		#
[8]	SEC flush-encased gearbox without blocking device	1
[14]	SEC rebate-clearance reduction flush-encased gearbox	1
[15]	SEC drilling protection	1
[16]	SEC connector	2
[24]	Countersunk screw ST4.8 x 16	1
[35]	Cylinder screw M5 x 8	2

[14] SEC rebate-clearance reduction flush-encased gearbox

			Nº
SEC rebate-clearance reduction ESP	For Roto Line lock handles	50 Piece(s)	334360

[15] SEC drilling protection

			Nº
SEC drilling protection	For Roto Line lock handles	10 Piece(s)	487406

[24] Countersunk screw ST4.8 x 16

			Nº
Countersunk screw	ST4,8x16	100 Piece(s)	728933

[11] Roto Line window handle, lockable

→ CTL_1

Alternatively:

[a] Roto Line window handle – geared-handle, lockable 1 → CTL_1

Espagnolette support  1 → *from page 162*

Cylinder screw M5 x 12  2 → *from page 167*

[13] Countersunk screw M5 x 30

			Nº
Countersunk screw	M5x30	100 Piece(s)	212501



Height-dependent components

[5] Striker			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920
			
≤ 1300			–
1301 – 1800			2
1801 – 2400			4
> 2400			6

[6] Cam, insertable		
		Nº
Insertable	100 Piece(s)	334671
		
≤ 1300		–
1301 – 1800		2
1801 – 2400		4
> 2400		6

Width-dependent components

[5] Striker			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920
			
≤ 1300			–
> 1300			2

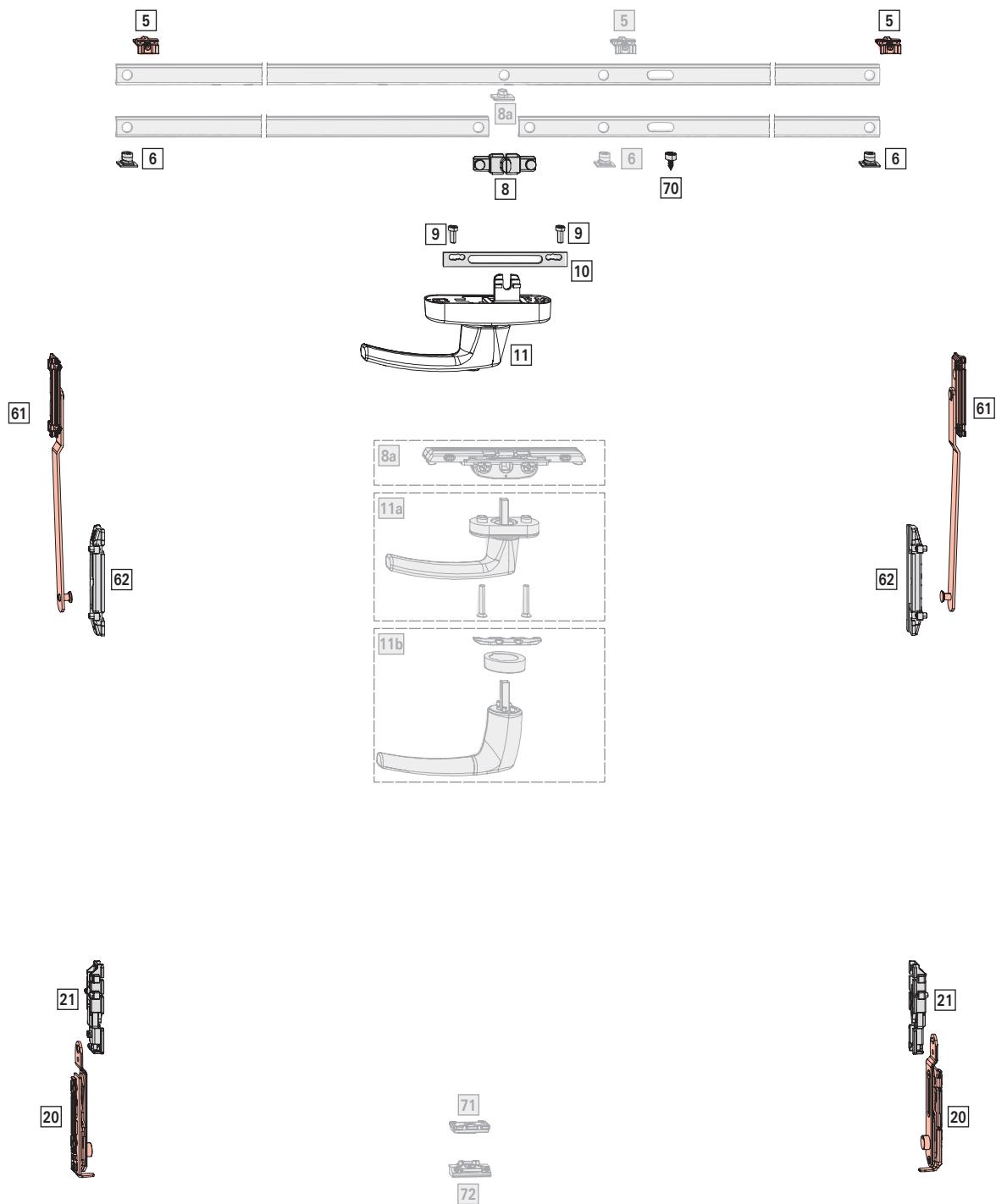
[6] Cam, insertable		
		Nº
Insertable	100 Piece(s)	334671
		
≤ 1300		–
> 1300		2

[7] SEC striker			
			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638
			
≤ 1100			–
> 1100			1

[8] SEC cam		RC 3
		Nº
Insertable	100 Piece(s)	443530
		
≤ 1100		–
> 1100		1

4.4 Tilt-Only hardware, handle at the top

4.4.1 TiSt | 100 kg



Hardware overviews

Tilt-Only hardware, handle at the top

TiSt | 100 kg



Application range

SW: 520 – 1600 mm

SH: 500 – 1300 mm

S.kg: max. 100 kg



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[*] TiSt locking components set 1

Large packages

		Nº
V.01	10 Piece(s)	728858
V.02	10 Piece(s)	728859

Contents:

[*]		#
[5]	Striker V.01 / V.02	2
[6]	Cam, insertable	2
[61]	Tilt-Only stay arm, compl.	2
[62]	Slide bar, compl.	2

[20] Rebate sash stay with clamp strip 2

			Nº
No. 1	Left	10 Piece(s)	627256
	Right	10 Piece(s)	627255
No. 3	Left	10 Piece(s)	627258
	Right	10 Piece(s)	627257
No. 4	Left	10 Piece(s)	627260
	Right	10 Piece(s)	627259

[21] Rebate stay hinge 2

	Nº
10 Piece(s)	740811

[70] Locking sleeve 1

			Nº
Locking sleeve	Blocks the movement of the espagnolette (90°)	100 Piece(s)	738549

Espagnolette and connector

[*] T connector set 1

Alternatively:

[27] Connector bolt, insertable  1

[8a] Flush-encased gearbox 1 → from page 163

		Nº
AL T connector set	10 Piece(s)	728981

Contents:

[*]		
[8]	T connector	1
[9]	Cylinder screw M5 x 12	2

[10] Espagnolette support 1

				Nº
Espagnolette support	For Roto Line AL geared-handle	13.5	100 Piece(s)	331937

[11] Roto Line window handle – geared-handle 1

→ CTL_1

Alternatively:

[a]	Roto Line window handle – stand-ard	 1	→ CTL_1
	Countersunk screw M5 x 30	 2	
[b]	Roto Line window handle – handle without escutcheon	 1	→ CTL_1
	Ring for handle without escutcheon	 1	
	Mounting plate	 1	

Width-dependent components

[5] Striker

			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

	
≤ 1300	–
> 1300	1

[6] Cam, insertable

		Nº
Insertable	100 Piece(s)	334671

	
≤ 1300	–
> 1300	1

[*] CL set

		Nº
V.01	10 Piece(s)	740813
V.02	10 Piece(s)	740812

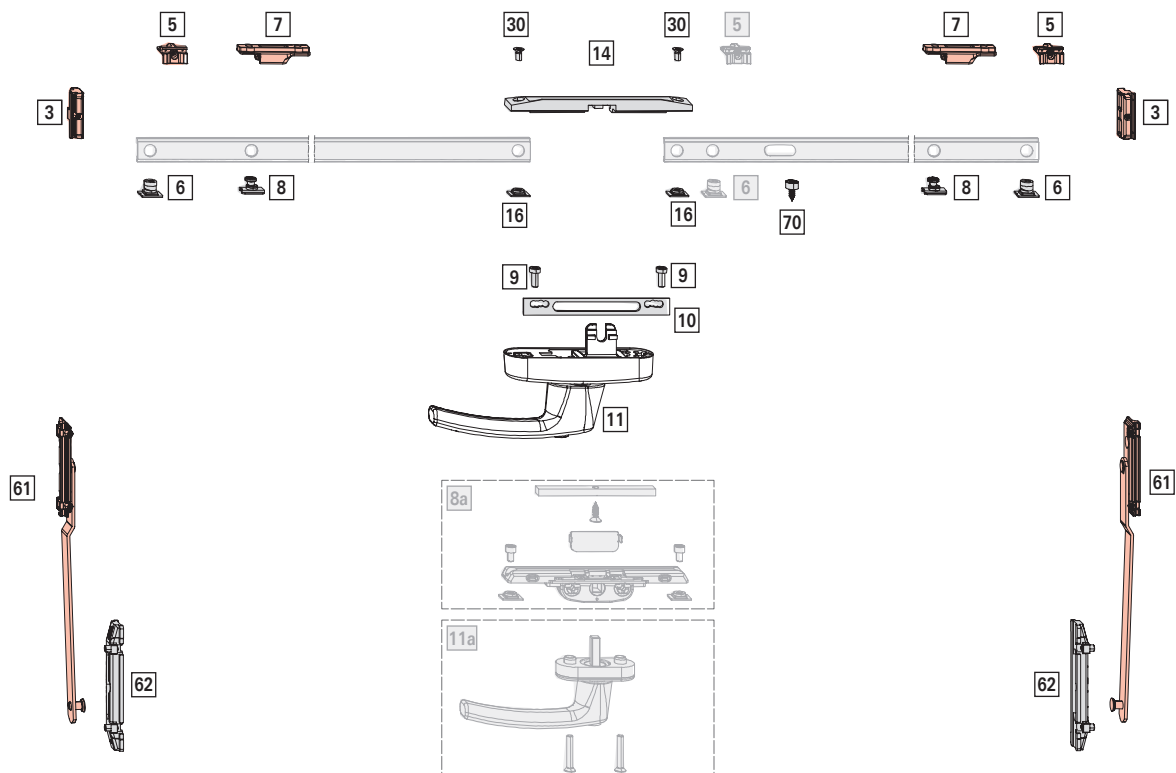
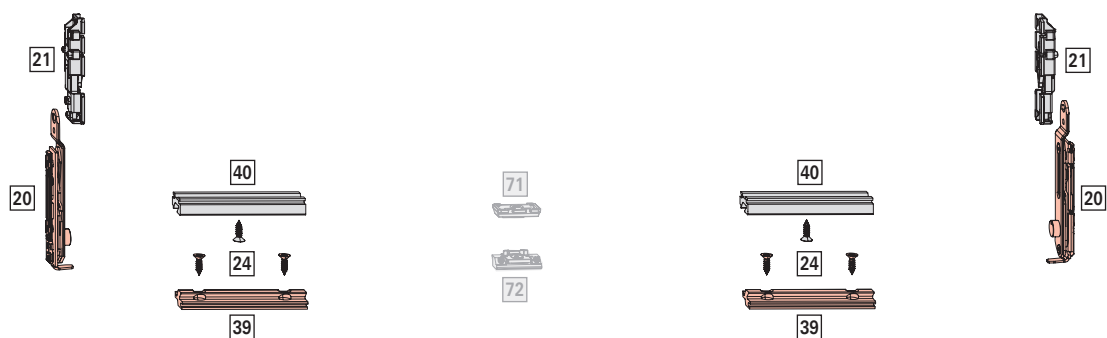
Contents:

[*] 		#
[71]	CL sash component	1
[72]	CL frame component V.01 / V.02	1

	
≤ 1300	–
> 1300	1



4.4.2 TiSt | RC 2 | 100 kg





Application range

SW: 520 – 1600 mm

SH: 500 – 1300 mm

S.kg: max. 100 kg



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[*] TiSt locking components set 			
Large packages			
		Nº	
V.01	10 Piece(s)	728858	
V.02	10 Piece(s)	728859	

Contents:

[*]		#
[5]	Striker V.01 / V.02	2
[6]	Cam, insertable	2
[61]	Tilt-Only stay arm, compl.	2
[62]	Slide bar, compl.	2

[20] Rebate sash stay with clamp strip 			
			Nº
No. 1	Left	10 Piece(s)	627256
	Right	10 Piece(s)	627255
No. 3	Left	10 Piece(s)	627258
	Right	10 Piece(s)	627257
No. 4	Left	10 Piece(s)	627260
	Right	10 Piece(s)	627259

[21] Rebate stay hinge 			
	Nº		
10 Piece(s)	740811		

[70] Locking sleeve 			
			Nº
Locking sleeve	Blocks the movement of the espagnolette (90°)	100 Piece(s)	738549

[*] SEC hinge lock set 			
		Nº	
V.01	10 Piece(s)	728940	
V.02	10 Piece(s)	728941	

Contents:

[*]		#
[24]	Countersunk screw ST4.8 x 16	3
[39]	Frame component V.01 / V.02	1
[40]	Sash component	1

[2] Tilt striker 			
		Nº	
Tilt striker	100 Piece(s)	728860	

[7] SEC striker 			
			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638

[8] SEC cam RC 2 			
		Nº	
Insertable	100 Piece(s)	447245	

Espagnolette and connector

[*] SEC espagnolette protection set 			
Large packages			
Alternatively:			
[8a]	SEC flush-encased gearbox set 	1	→ from page 170
		Nº	
SEC espagnolette protection set	10 Piece(s)	728952	

Contents:

[*]		#
[14]	SEC espagnolette protection	1
[16]	SEC connector	2
[30]	Countersunk screw M5 x 10	2

[9] Cylinder screw M5 x 12 			
		Nº	
Cylinder screw	M5x12	100 Piece(s)	728925

[10] Espagnolette support 			
			Nº
Espagnolette support	For Roto Line AL geared-handle	13.5	100 Piece(s) 331937

[11] Roto Line window handle – geared-handle, lockable 			
→ CTL_1			
Alternatively:			
[a]	Roto Line window handle, lockable		1 → CTL_1
	Countersunk screw M5 x 30		2

Width-dependent components

[5] Striker			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920
			
≤ 1300			–
> 1300			1

[6] Cam, insertable			
		Nº	
Insertable	100 Piece(s)	334671	
			
≤ 1300			–
> 1300			1

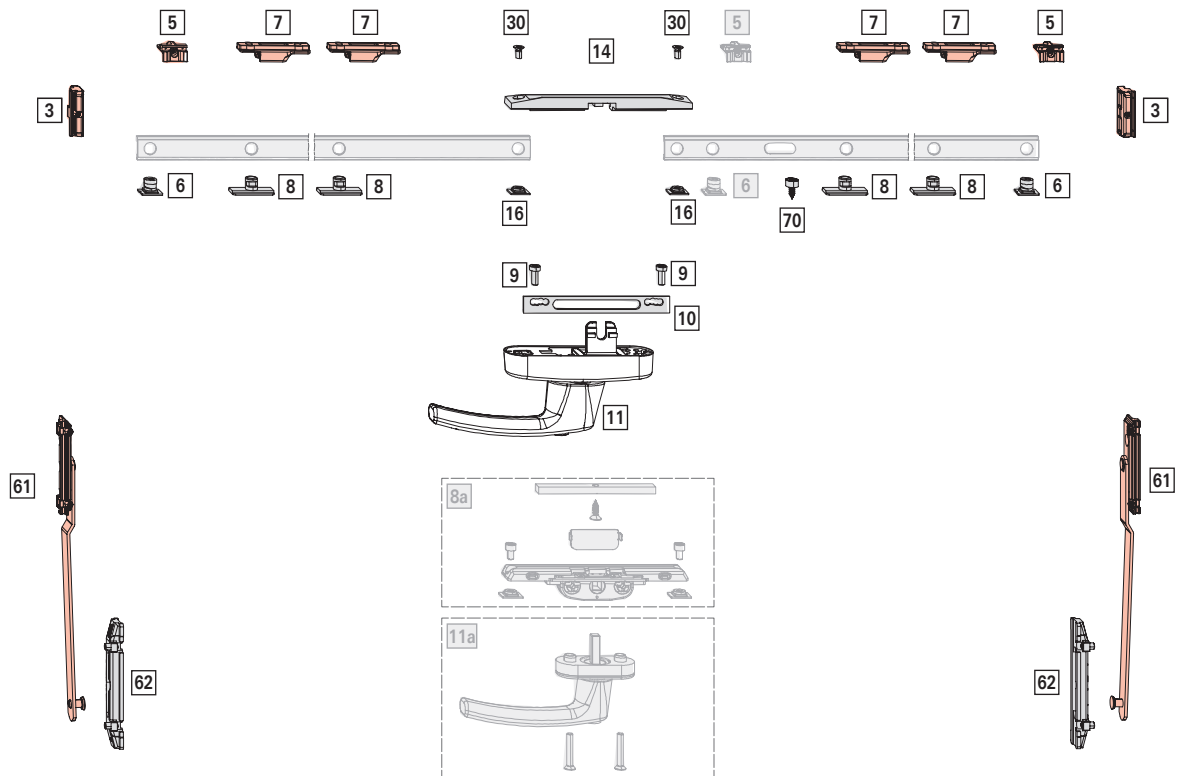
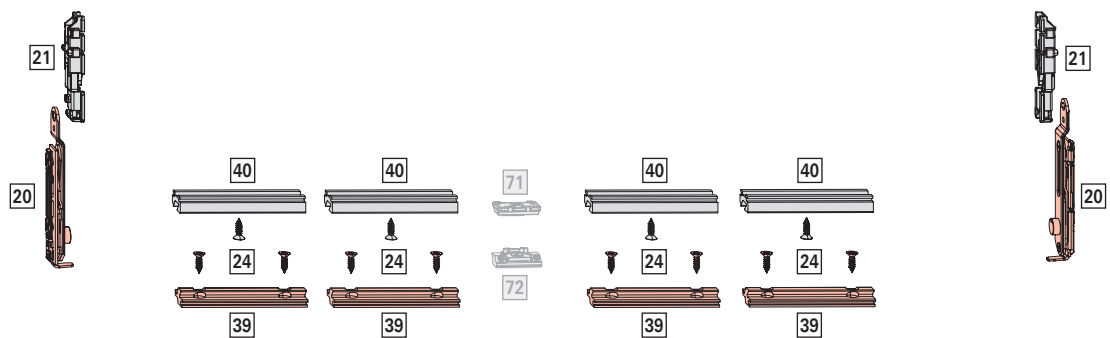
[*] CL set			
		Nº	
V.01	10 Piece(s)	740813	
V.02	10 Piece(s)	740812	

Contents:

[*]		#
[71]	CL sash component	1
[72]	CL frame component V.01 / V.02	1
		
≤ 1300		–
> 1300		1



4.4.3 TiSt | RC 3 | 100 kg



**Application range****SW:** 670 – 1600 mm**SH:** 500 – 1300 mm**S.kg:** max. 100 kg**INFO**

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[*] TiSt locking components set 			
Large packages			
		Nº	
V.01	10 Piece(s)	728858	
V.02	10 Piece(s)	728859	

Contents:

[*]		#
[5]	Striker V.01 / V.02	2
[6]	Cam, insertable	2
[61]	Tilt-Only stay arm, compl.	2
[62]	Slide bar, compl.	2

[20] Rebate sash stay with clamp strip 			
			Nº
No. 1	Left	10 Piece(s)	627256
	Right	10 Piece(s)	627255
No. 3	Left	10 Piece(s)	627258
	Right	10 Piece(s)	627257
No. 4	Left	10 Piece(s)	627260
	Right	10 Piece(s)	627259

[21] Rebate stay hinge 			
	Nº		
10 Piece(s)	740811		

[70] Locking sleeve 			
			Nº
Locking sleeve	Blocks the movement of the espagnolette (90°)	100 Piece(s)	738549

[*] SEC hinge lock set 			
		Nº	
V.01	10 Piece(s)	728940	
V.02	10 Piece(s)	728941	

Contents:

[*]		#
[24]	Countersunk screw ST4.8 x 16	3
[39]	Frame component V.01 / V.02	1
[40]	Sash component	1

[2] Tilt striker 			
		Nº	
Tilt striker	100 Piece(s)	728860	

[7] SEC striker 			
			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638

[8] SEC cam RC 3 			
		Nº	
Insertable	100 Piece(s)	443530	

Espagnolette and connector

[*] SEC espagnolette protection set 			
Large packages			
Alternatively:			
[8a]	SEC flush-encased gearbox set 	1	→ from page 170
		Nº	
SEC espagnolette protection set	10 Piece(s)	728952	

Contents:

[*]		#
[14]	SEC espagnolette protection	1
[16]	SEC connector	2
[30]	Countersunk screw M5 x 10	2

[9] Cylinder screw M5 x 12 			
		Nº	
Cylinder screw	M5x12	100 Piece(s)	728925

[10] Espagnolette support 			
			Nº
Espagnolette support	For Roto Line AL geared-handle	13.5	100 Piece(s) 331937

[11] Roto Line window handle – geared-handle, lockable 			
→ CTL_1			
Alternatively:			
[a]	Roto Line window handle, lockable		1 → CTL_1
	Countersunk screw M5 x 30		2

Width-dependent components

[5] Striker			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920
			
≤ 1300			–
> 1300			1

[6] Cam, insertable			
		Nº	
Insertable	100 Piece(s)	334671	
			
≤ 1300			–
> 1300			1

[*] CL set			
		Nº	
V.01	10 Piece(s)	740813	
V.02	10 Piece(s)	740812	

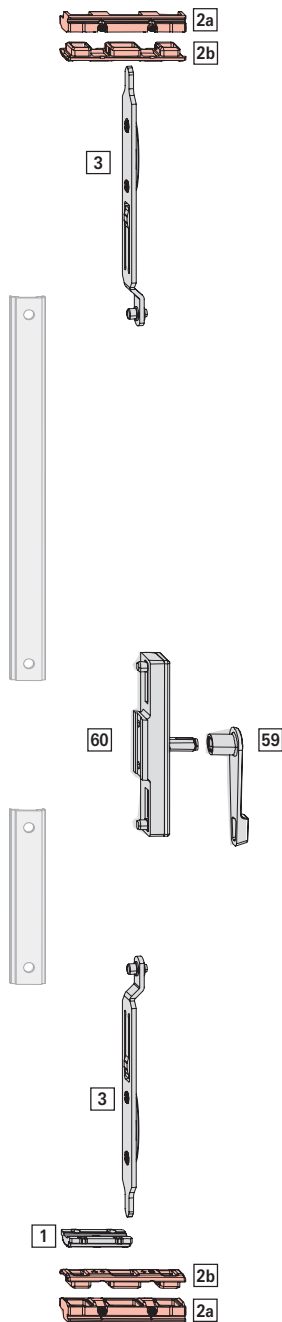
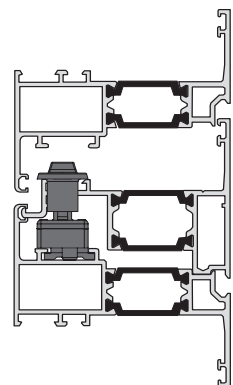
Contents:

[*]		#
[71]	CL sash component	1
[72]	CL frame component V.01 / V.02	1
		
≤ 1300		–
> 1300		1



4.5 Floating-mullion hardware

4.5.1 FM





Application range

SW (second opening sash): 200 – 1600 mm

SH: 856 – 2700 mm

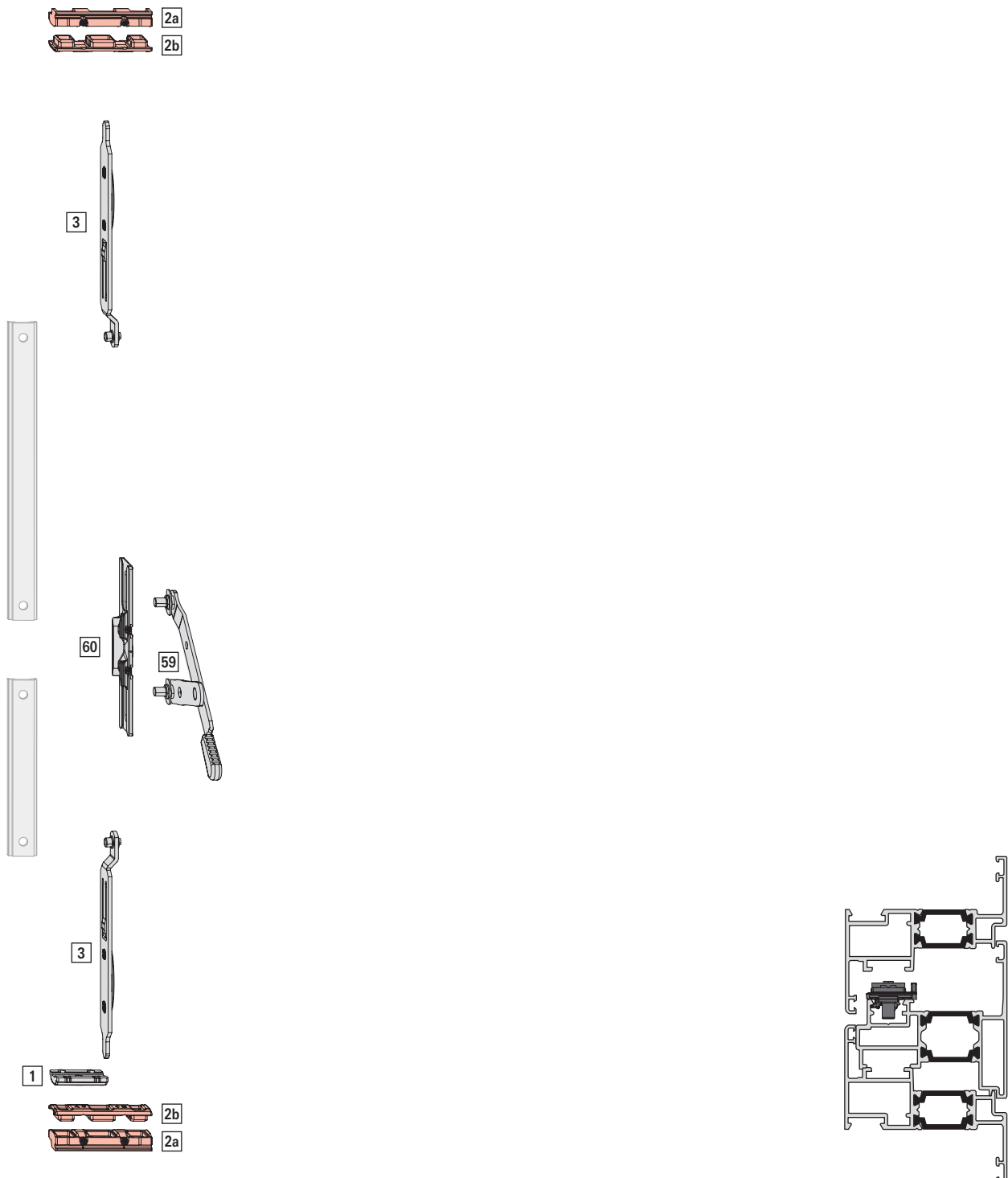
Locking side of second opening sash

[*] FM locking components set 		
		Nº
FM locking components set	10 Piece(s)	798167

Contents:

[*]		#
[1]	Run-up block	1
[2a]	Multi-ported striker bottom part	2
[2b]	Multi-ported striker top part VB 5/6	2
[3]	Shootbolt rod (length 152; width 19.1)	2
[59]	Operating lever	1
[60]	FM espagnolette	1
	Reducing sleeve (not sh.)	4

4.5.2 FM-Su





Application range

SW (second opening sash): 200 – 1600 mm

SH: 856 – 2700 mm



INFO

Can only be used in profiles with a double-C-groove.

Locking side of second opening sash

[*] **FM-Su espagnolette set**; surface-mounted 1

		Nº
FM-Su espagnolette set; surface-mounted	20 Piece(s)	2006294

Contents:

[*]		#
[59]	Toggle lever, compl.	1
[60]	Guide rail, compl.	1
Not sh.	Compensating bush	4

[1] **Run-up block** 2

		Nº
Run-up block	100 Piece(s)	212008

[*] **Multi-ported striker set** 2

		Nº
VB 1/2	20 Piece(s)	728912
VB 3/4	20 Piece(s)	728913
VB 5/6	20 Piece(s)	728914

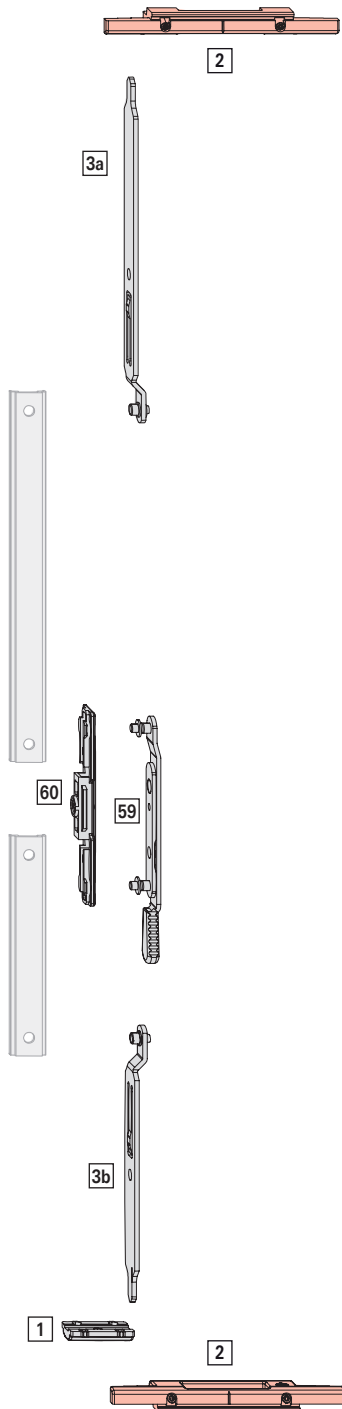
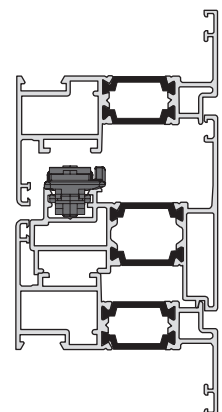
Contents:

[*]		#
[2a]	Multi-ported striker bottom part	1
[2b]	Multi-ported striker top part	1

[3] **Shootbolt rod** 2

				Nº
152	Stainless steel	19.1	100 Piece(s)	2008145
		18.3	100 Piece(s)	2008146
		17.5	100 Piece(s)	2008147

4.5.3 FM-SuN





Application range

For narrow floating-mullion profiles with connecting rod groove < 15 mm.

SW (second opening sash): 200 – 1600 mm

SH: 675 – 2700 mm



INFO

Can only be used in profiles with a double-C-groove.

Locking side of second opening sash

[*] FM-SuN locking components set 		
		Nº
FM-SuN locking component set	10 Piece(s)	776947

Contents:

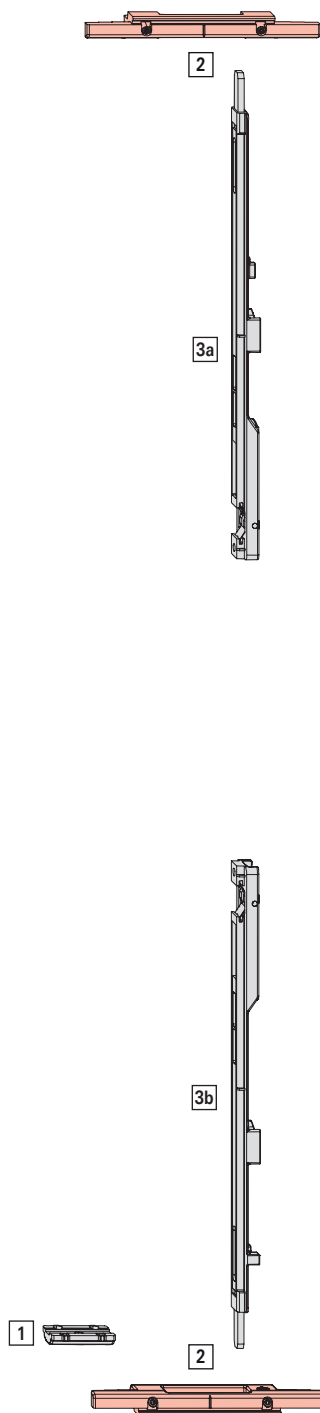
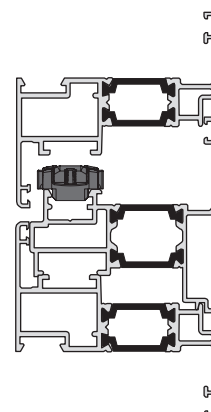
[*]		#
[1]	Run-up block	1
[2]	FM-Sh multi-ported striker, compl.	2
[3a]	FM-SuN shootbolt rod, right	1
[3b]	FM-SuN shootbolt rod, left	1
[59]	Toggle lever, compl.	1
[60]	Guide rail, compl.	1
	Reducing sleeve (not sh.)	4



INFO

Connecting rods from the Roto product range cannot be used. Narrower connecting rods are required.

4.5.4 FM-Sh





Application range

SW (second opening sash): 200 – 1600 mm

SH: 780 – 2700 mm

Locking side of second opening sash

[*] FM-Sh locking components set 		
		Nº
FM-Sh locking components set	10 Piece(s)	728960

Contents:

[*] 		#
[1]	Run-up block	1
[2]	FM-Sh multi-ported striker, compl.	2
[3a]	FM-Sh shootbolt, top	1
[3b]	FM-Sh shootbolt, bottom	1
	Self-tapping screw ST3.9 x 25 (not shown)	1

4.5.5 FM-R





Application range

SW (second opening sash): 200 – 1600 mm

SH: 780 – 2700 mm



INFO

Can only be used in profiles with a double-C-groove.

Locking side of second opening sash

[60] Slider 			
		Nº	
19	100 Piece(s)	212141	
18	100 Piece(s)	212142	
18	100 Piece(s)	212143	

[1] Run-up block 			
		Nº	
Run-up block	100 Piece(s)	212008	

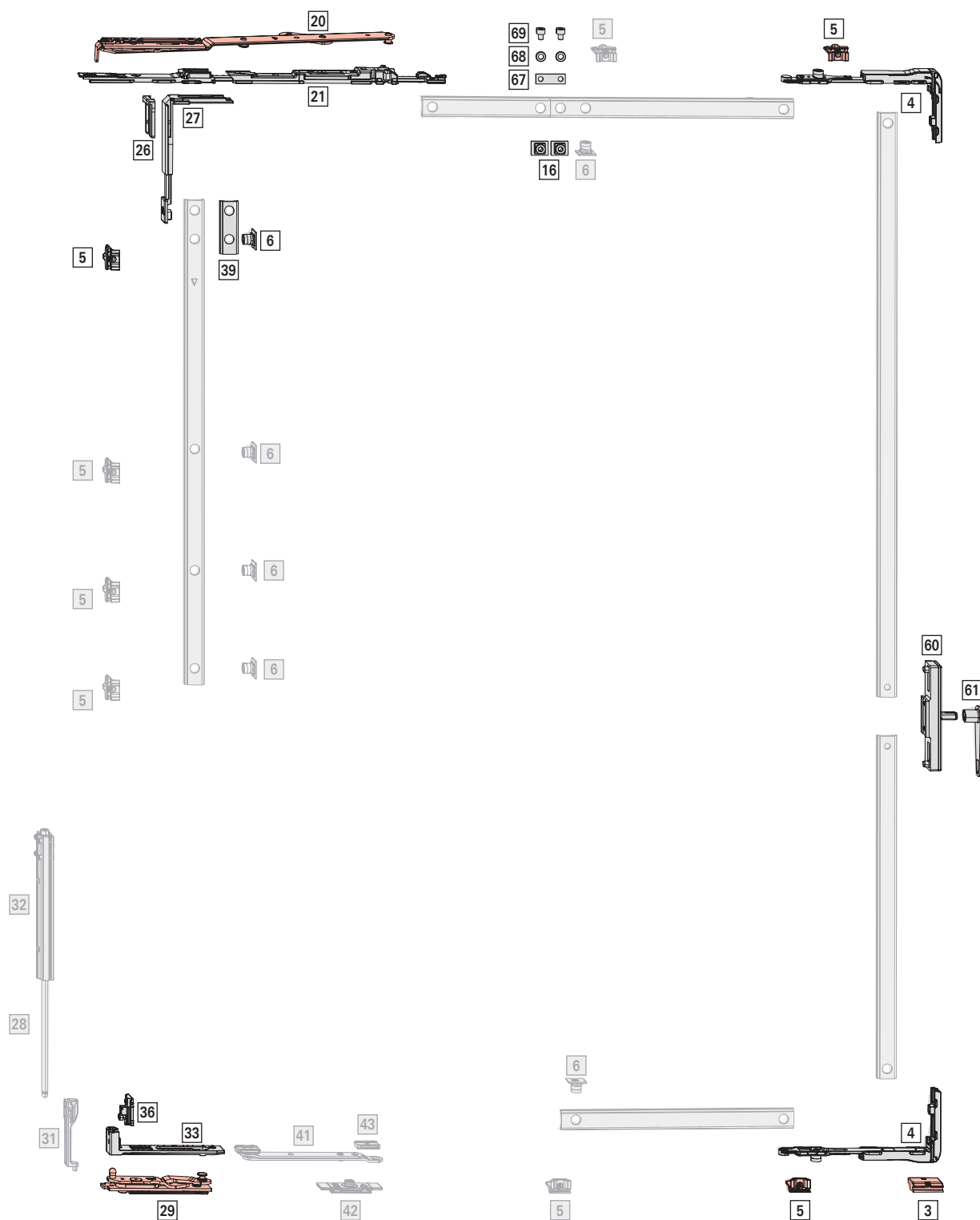
[*] Multi-ported striker set 			
		Nº	
VB 1/2	20 Piece(s)	728912	
VB 3/4	20 Piece(s)	728913	
VB 5/6	20 Piece(s)	728914	

Contents:

[*]		#
[2a]	Multi-ported striker bottom part	1
[2b]	Multi-ported striker top part	1

[3] Shootbolt rod 				
				Nº
152	Stainless steel	19.1	100 Piece(s)	2008145
		18.3	100 Piece(s)	2008146
		17.5	100 Piece(s)	2008147

4.5.6 FM, couplable (second opening sash) | 150 kg





Application range

SW (second opening sash): 710 – 1600 mm

SH: 856 – 2700 mm

S.kg: max. 150 kg



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest with clamp strip 			
			Nº
No. 1	Left	10 Piece(s)	624970
	Right	10 Piece(s)	624969
No. 3	Left	10 Piece(s)	624972
	Right	10 Piece(s)	624971
No. 4	Left	10 Piece(s)	624974
	Right	10 Piece(s)	624973

[*] Corner hinge set 			
			Nº
Left		10 Piece(s)	739700
Right		10 Piece(s)	739699

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] T-O locking components set 			
			Nº
V.01		10 Piece(s)	728743
V.02		10 Piece(s)	728744

[*]		
[3]	Run-up wedge V.01 / V.02	1
[4]	Corner drive without blocking device, with retaining fork	2
[5]	Striker V.01 / V.02	4
[6]	Cam, insertable	2

[*] Coupler component set 			
			Nº
Coupler component set	For coupling a connecting rod	100 Piece(s)	728856

[*]		#
[16]	SEC connector	2
[67]	SEC coupler component, plate	1
[68]	Washer	2
[69]	Cylinder screw M5 x 6	2

[21] Scissor stay guide 			
			Nº
500		10 Piece(s)	740850

[20] Sash stay 					
					Nº
500	No. 1	130	Left	10 Piece(s)	624945
		130	Right	10 Piece(s)	624944
	No. 3	130	Left	10 Piece(s)	624951
		130	Right	10 Piece(s)	624950
	No. 4	130	Left	10 Piece(s)	624957
		130	Right	10 Piece(s)	624956

[*] CL corner drive set 			
Large packages			
			Nº
V.01		20 Piece(s)	728842
V.02		20 Piece(s)	728843

Contents:

[*]		#
[5]	Striker V.01 / V.02	2
[6]	Cam, insertable	2
[26]	Retaining fork	1
[27]	CL corner drive	1

Espagnolette and connector

[*] FM espagnolette set 			
			Nº
FM espagnolette set		20 Piece(s)	728965

Contents:

[*]		#
[60]	FM espagnolette, internal	1
[61]	Operating lever	1
	Reducing sleeve	2

Hardware overviews

Floating-mullion hardware

FM, couplable (second opening sash) | 150 kg

Height-dependent components

[5] Striker			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920
			
≤ 1800			–
1801 – 2400			1
> 2400			2

[6] Cam, insertable		
		Nº
Insertable	100 Piece(s)	334671
		
≤ 1800		–
1801 – 2400		1
> 2400		2

[39] Connecting rod, fixed, vertical (CR4) 			
→ from page 165			

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1

Width-dependent components

[*] Turn restrictor set, with stop 			
Alternatively:			
Turn restrictor set, braked, damped		 1	→ from page 171
			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

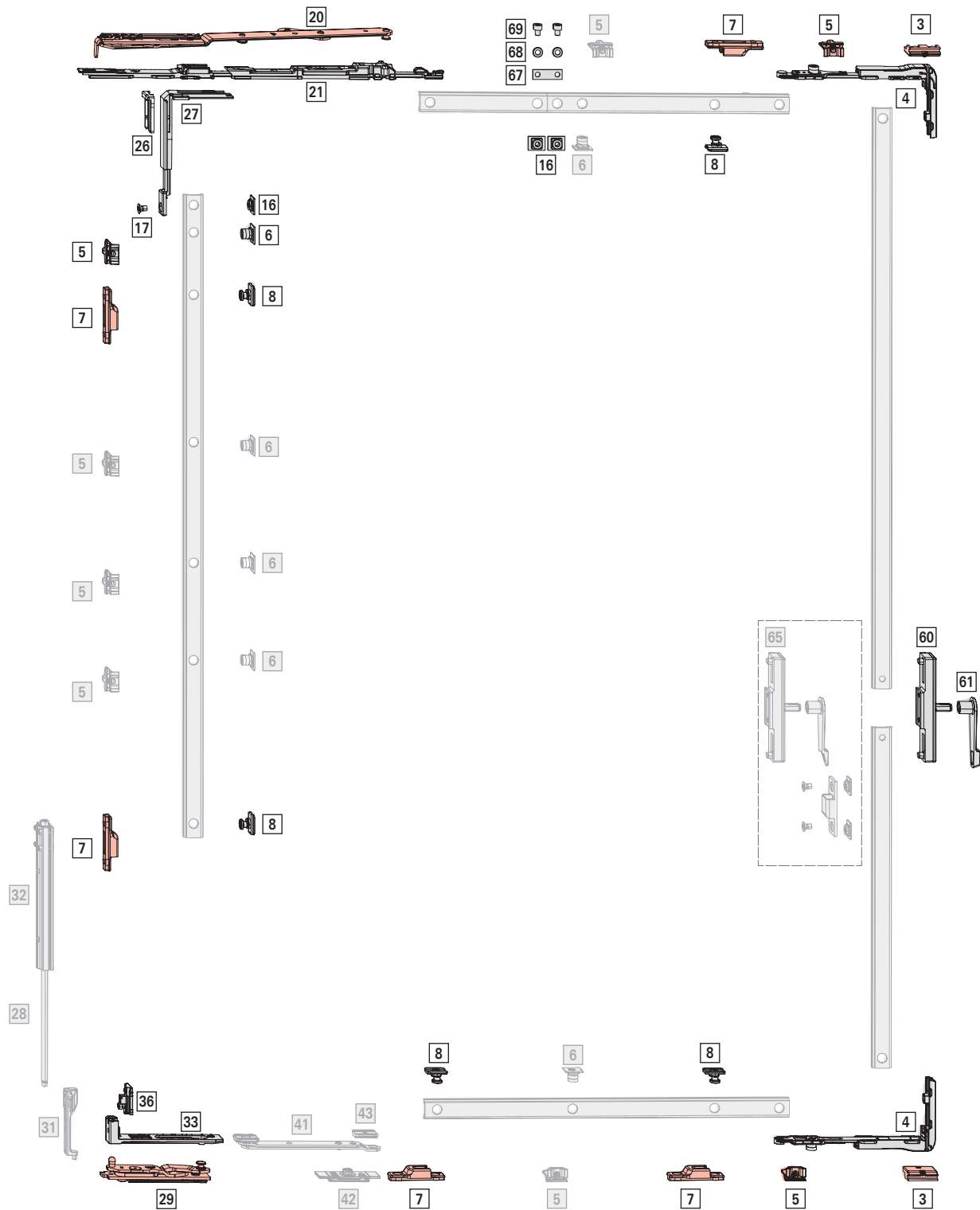
[*]		
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1
		
≤ 1200		–
> 1200		1

Weight-dependent components

[*] Load transfer set; S.kg > 100 kg 			
			Nº
V.01	Left	10 Piece(s)	739694
	Right	10 Piece(s)	739693
V.02	Left	10 Piece(s)	739696
	Right	10 Piece(s)	739695



4.5.7 FM, couplable (second opening sash) | RC 2 | 150 kg





Application range

SW (second opening sash): 800 – 1600 mm

SH: 720 – 2700 mm

S.kg: max. 150 kg



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest with clamp strip 			
			Nº
No. 1	Left	10 Piece(s)	624970
	Right	10 Piece(s)	624969
No. 3	Left	10 Piece(s)	624972
	Right	10 Piece(s)	624971
No. 4	Left	10 Piece(s)	624974
	Right	10 Piece(s)	624973

[*] Corner hinge set 			
			Nº
Left		10 Piece(s)	739700
Right		10 Piece(s)	739699

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] T-O locking components set 			
			Nº
V.01		10 Piece(s)	728743
V.02		10 Piece(s)	728744

[*]		
[3]	Run-up wedge V.01 / V.02	1
[4]	Corner drive without blocking device, with retaining fork	2
[5]	Striker V.01 / V.02	4
[6]	Cam, insertable	2

[*] Coupler component set 			
			Nº
Coupler component set	For coupling a connecting rod	100 Piece(s)	728856

[*]		#
[16]	SEC connector	2
[67]	SEC coupler component, plate	1
[68]	Washer	2
[69]	Cylinder screw M5 x 6	2

[21] Scissor stay guide 			
			Nº
500		10 Piece(s)	740850

[20] Sash stay 					
					Nº
500	No. 1	130	Left	10 Piece(s)	624945
		130	Right	10 Piece(s)	624944
	No. 3	130	Left	10 Piece(s)	624951
		130	Right	10 Piece(s)	624950
	No. 4	130	Left	10 Piece(s)	624957
		130	Right	10 Piece(s)	624956

[*]

CL SEC corner drive set

[7] SEC striker 			
			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638

[8] SEC cam RC 2 			
			Nº
Insertable		100 Piece(s)	447245

[3] Run-up wedge 			
			Nº
Run-up wedge	V.01	100 Piece(s)	684282
	V.02	100 Piece(s)	684283

Hardware overviews

Floating-mullion hardware

FM, couplable (second opening sash) | RC 2 | 150 kg

Espagnolette and connector

[*] FM espagnolette set 	
Alternative (profile related):	
[65] FM SEC espagnolette set	→ from page 170

		Nº
FM espagnolette set	20 Piece(s)	728965

Contents:

[*]		#
[60]	FM espagnolette, internal	1
[61]	Operating lever	1
	Reducing sleeve	2

Height-dependent components

[5] Striker 			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

	
≤ 1800	–
1801 – 2400	1
> 2400	2

[6] Cam, insertable		
		Nº
Insertable	100 Piece(s)	334671
<hr/>		
		
≤ 1800	–	
1801 – 2400	1	
> 2400	2	

Width-dependent components

[5] Striker 			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

	
≤ 1300	–
> 1300	2

[6] Cam, insertable		
		Nº
Insertable	100 Piece(s)	334671
		
≤ 1300		—
> 1300		2

[*] Turn restrictor set, with stop 	
Alternatively:	
Turn restrictor set, braked,	 1 → from page 171
damped	

			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

[*]		
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1

	
≤ 1200	–
> 1200	1

Weight-dependent components

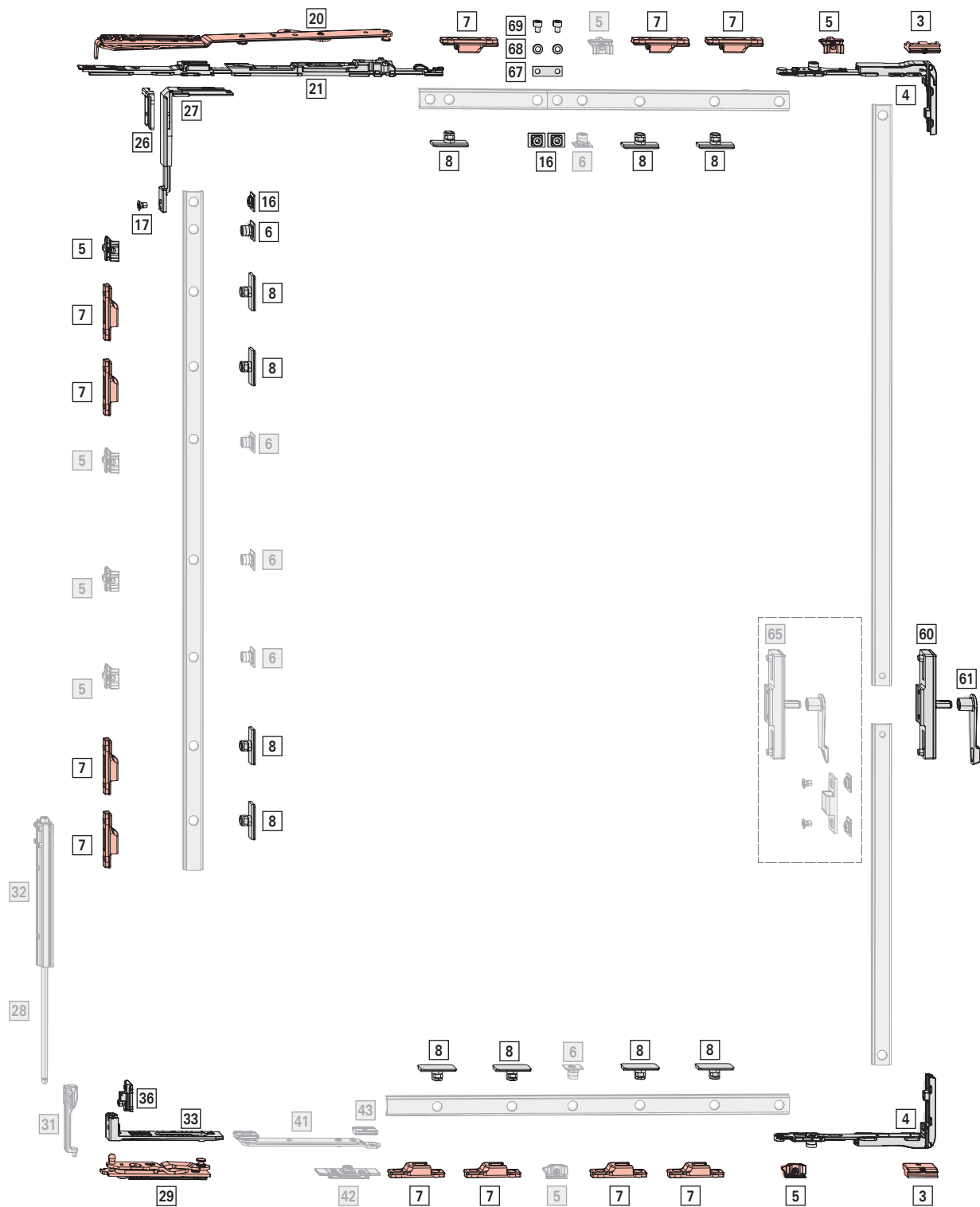
[*] Load transfer set; S.kg > 100 kg 			
			Nº
V.01	Left	10 Piece(s)	739694
	Right	10 Piece(s)	739693
V.02	Left	10 Piece(s)	739696
	Right	10 Piece(s)	739695

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1



4.5.8 FM, couplable (second opening sash) | RC 3 | 150 kg





Application range

SW (second opening sash): 875 – 1600 mm

SH: 870 – 2700 mm

S.kg: max. 150 kg



INFO

Only use bearings / clamp strips which have been approved for the profile. Information can be obtained from Roto sales representatives.

Basic set

[29] Pivot rest with clamp strip 			
			Nº
No. 1	Left	10 Piece(s)	624970
	Right	10 Piece(s)	624969
No. 3	Left	10 Piece(s)	624972
	Right	10 Piece(s)	624971
No. 4	Left	10 Piece(s)	624974
	Right	10 Piece(s)	624973

[*] Corner hinge set 			
			Nº
Left		10 Piece(s)	739700
Right		10 Piece(s)	739699

Contents:

[*]		#
[33]	Corner hinge	1
[36]	Adjustment piece	1

[*] T-O locking components set 			
			Nº
V.01		10 Piece(s)	728743
V.02		10 Piece(s)	728744

[*]		
[3]	Run-up wedge V.01 / V.02	1
[4]	Corner drive without blocking device, with retaining fork	2
[5]	Striker V.01 / V.02	4
[6]	Cam, insertable	2

[*] Coupler component set 			
			Nº
Coupler component set	For coupling a connecting rod	100 Piece(s)	728856
[*]		#	
[16]	SEC connector	2	
[67]	SEC coupler component, plate	1	
[68]	Washer	2	
[69]	Cylinder screw M5 x 6	2	

[21] Scissor stay guide 			
			Nº
500		10 Piece(s)	740850

[20] Sash stay 					
					Nº
500	No. 1	130	Left	10 Piece(s)	624945
			Right	10 Piece(s)	624944
	No. 3	130	Left	10 Piece(s)	624951
			Right	10 Piece(s)	624950
	No. 4	130	Left	10 Piece(s)	624957
			Right	10 Piece(s)	624956

[*] CL SEC corner drive set 			
Large packages			
			Nº
SEC corner drive CL set with retaining fork		10 Piece(s)	728944
[*]		#	
[16]	SEC connector	1	
[17]	Countersunk screw M5 x 7	1	
[26]	SEC retaining fork	1	
[27]	CL SEC corner drive	1	

[7] SEC striker 			
			Nº
V.01	9	100 Piece(s)	212637
V.02	9	100 Piece(s)	212638

[8] SEC cam RC 3 			
			Nº
Insertable		100 Piece(s)	443530

[3] Run-up wedge 			
			Nº
Run-up wedge	V.01	100 Piece(s)	684282
	V.02	100 Piece(s)	684283

Hardware overviews

Floating-mullion hardware

FM, couplable (second opening sash) | RC 3 | 150 kg

Espagnolette and connector

[*] FM espagnolette set  1		
Alternative (profile related):		
[65] FM SEC espagnolette set	→ from page 170	

		Nº
FM espagnolette set	20 Piece(s)	728965

Contents:

[*]		#
[60]	FM espagnolette, internal	1
[61]	Operating lever	1
	Reducing sleeve	2

Height-dependent components

[5] Striker			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

	
≤ 1800	–
1801 – 2400	1
> 2400	2

[6] Cam, insertable		
		Nº
Insertable	100 Piece(s)	334671

	
≤ 1800	–
1801 – 2400	1
> 2400	2

Width-dependent components

[5] Striker			
			Nº
V.01	9	100 Piece(s)	728918
V.02	9	100 Piece(s)	728920

	
≤ 1300	–
> 1300	2

[6] Cam, insertable		
		Nº
Insertable	100 Piece(s)	334671

	
≤ 1300	–
> 1300	2

[*] Turn restrictor set, with stop  1		
Alternatively:		
Turn restrictor set, braked,	 1	→ from page 171
damped		

			Nº
Clampable	V.01	10 Piece(s)	2004506
	V.02	10 Piece(s)	2027613

Contents:

[*]		
[41]	Rotating arm, compl.	1
[42]	Stop	1
[43]	Bearing, compl.	1

	
≤ 1200	–
> 1200	1

Weight-dependent components

[*] Load transfer set; S.kg > 100 kg  1			
			Nº
V.01	Left	10 Piece(s)	739694
	Right	10 Piece(s)	739693
V.02	Left	10 Piece(s)	739696
	Right	10 Piece(s)	739695

Contents:

[*]		#
[28]	Support rod	1
[31]	Frame bearing V.01 / V.02	1
[32]	Sash component	1



5 Jigs / tools

5.1 Installation jig

Sash stay



		Nº
Sash stay 500, sash stay 735, additional stay arm		810754

5.2 Drilling jigs

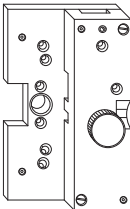
Stay bearing and pivot rest

Groove base thickness > 2 mm



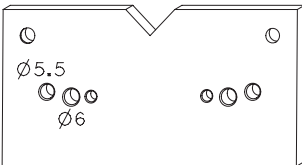
		Nº
Stay bearing / pivot rest		628534

Geared-handle



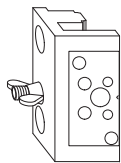
	Nº
Geared-handle, connecting rod, turn lock	212544

Geared-handle



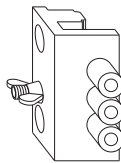
	Nº
Roto Line AL geared-handle	333473

Flush-encased gearbox and handle without escutcheon



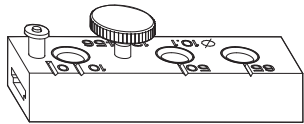
	Nº
Flush-encased gearbox and handle without escutcheon	365361

Flush-encased gearbox with Roto Line handle



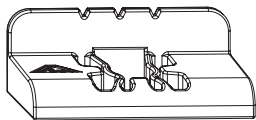
	Nº
Flush-encased gearbox with / without mis-handling device	212155

Connecting rod



	Nº
Connecting rod	333472

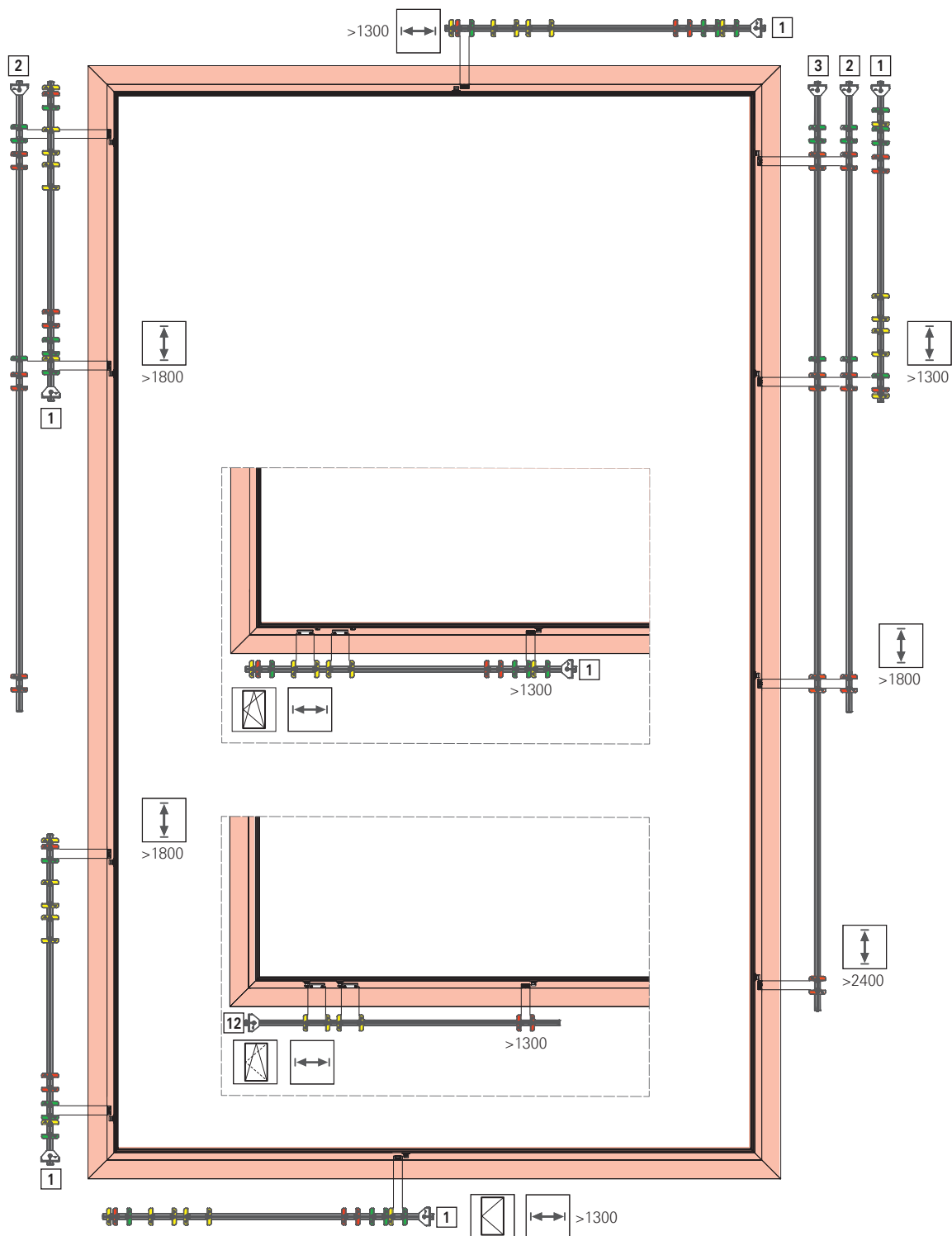
Striker



	Nº
Striker	774540



5.3 Positioning jigs



Positioning jigs, horizontal

				Nº
Positioning jig, short	1300 – 1600 mm	–	1 Piece(s)	739601
Positioning jig, short, 180 kg	1300 – 1600 mm	180 kg	1 Piece(s)	768934

Positioning jigs, vertical

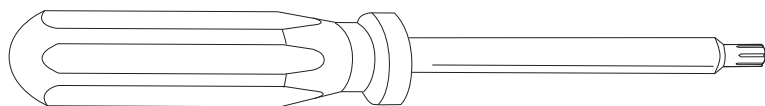
				Nº
Positioning jig, short	1300 – 1800 mm	–	1 Piece(s)	739601
Positioning jig, medium	1801 – 2400 mm		1 Piece(s)	739602
Positioning jig, long	2401 – 3000 mm		1 Piece(s)	739600

Size-specific combinations:

Description	Assignment	Position	Application range	Weight	T&T	TF	T-O	TiS
Positioning jig, short	[1]	Espagnolette side	SH 1301 – 1800 mm	–	■	■	■	–
Positioning jig, medium	[2]		SH 1801 – 2400 mm	–	■	■	■	–
Positioning jig, short	[1]	Hinge side	SH 1301 – 1800 mm	–	■	■	–	–
Positioning jig, long	[2]		SH 1801 – 2400 mm	–	■	■	–	–
Positioning jig, medium	[3]		SH > 2400 mm	–	■	■	–	–
Positioning jig, short	[1]	Horizontal at the top	SW > 1300 mm	–	■	■	■	–
Positioning jig, short	[1]	Horizontal at the bottom	SW > 1300 mm	–	■	■	–	–
Positioning jig, short, 180 kg	[12]		SW > 1300 mm	> 180 kg	■	■	–	–

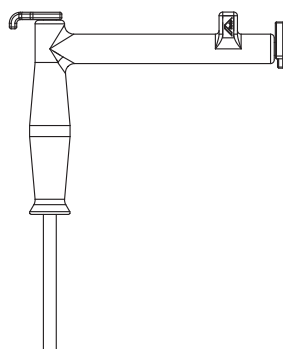
5.4 Tools

5.4.1 Hexalobular socket screwdriver



	Nº
Hexalobular socket screwdriver: T10	625172
Hexalobular socket screwdriver: T15	625173
Hexalobular socket screwdriver: T25	563971

5.4.2 Extractor handle

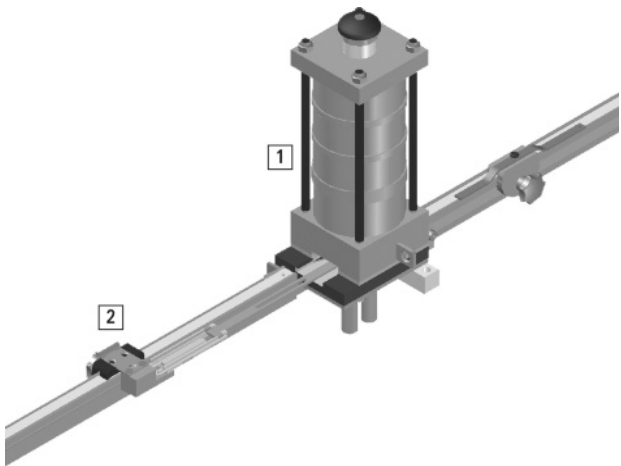




		Nº
	Extractor handle for stay-bearing pin	2042865
	Replacement blade	230765

5.4.3 Punches

5.4.3.1 Pneumatic punch



- [1] Pneumatic punch – PS 4
[2] Ruler for pneumatic punch – PS 4

	{Koppelstelle}		Nº
	Pneumatic punch – PS 4	Ø 10	1 Piece(s) 350309

Ruler

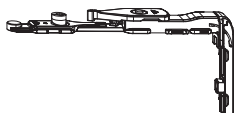
			Nº
	Ruler for pneumatic punch – PS 3 / PS 4	1 Piece(s)	350314

6 Large packaging for individual components

6.1 Locking components

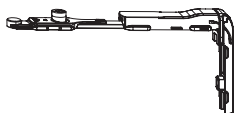
6.1.1 Corner drives and forks

[19] Corner drive with mishandling device



			Nº
Corner drive with mishandling device and retaining fork		100 Piece(s)	490173

[4] Corner drive without mishandling device



			Nº
Corner drive without mishandling device, with retaining fork		50 Piece(s)	728844

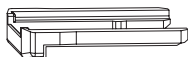
[27] Corner drive CL



			Nº
Corner drive CL without retaining fork		20 Piece(s)	331013

[26] Retaining fork

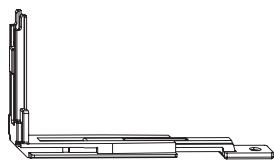
for corner drive CL



			Nº
Retaining fork		100 Piece(s)	221772



[27] SEC corner drive CL



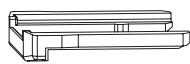
			Nº
SEC corner drive CL without retaining fork		10 Piece(s)	334359



INFO
Also order the SEC connector → *from page 166.*

[26] SEC retaining fork

for SEC corner drive CL



			Nº
SEC retaining fork		100 Piece(s)	212636

6.1.2 Deadbolt

6.1.2.1 Tilt lock bolt

[4] Tilt lock bolt

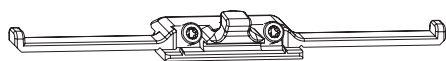
for T&T



			Nº
Tilt lock bolt		100 Piece(s)	490179

[3] Anti-lifting device

for T&T



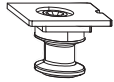
				Nº
Anti-lifting device	V.01	100 Piece(s)	728696	
	V.02	100 Piece(s)	728697	

Large packaging for individual components

Locking components

Run-up blocks

[12] TF tilt lock bolt



			Nº
TF tilt lock bolt		100 Piece(s)	334757

6.1.2.2 Shootbolt rod

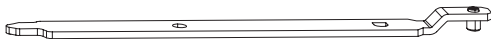
[3a] / [3b] FM-SuN shootbolt rod

for FM-SuN



INFO

Order one DIN R and one DIN L shootbolt rod for each hardware combination and pay attention to the "installation direction" when fitting them (see installation drawing → *from page 285*).

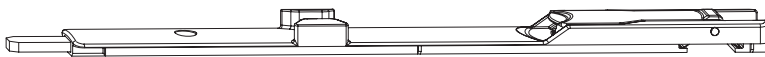


				Nº
180	14.4	Left	100 Piece(s)	373980
		Right	100 Piece(s)	373979

6.1.2.3 Shootbolt

[3a] / [3b] FM-Sh shootbolt

for FM-Sh



			Nº
Top	13.8	100 Piece(s)	355560
Bottom	13.8	100 Piece(s)	355561

6.1.3 Run-up blocks

[1] Run-up block (sash)

for T&T / T-O / TiSs



			Nº
Run-up block		100 Piece(s)	212008



[3] Run-up wedge (frame)

for T&T (S.kg ≥ 180 kg) / TF / T-O

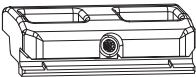


				Nº
Run-up wedge		V.01	100 Piece(s)	684282
		V.02	100 Piece(s)	684283

6.1.4 Tilt striker

[2] Tilt striker

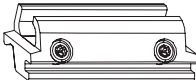
for T&T / T-O / TiSt



			Nº
Tilt striker		100 Piece(s)	728860

[2] Tilt striker

for TF

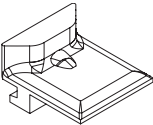


			Nº
	V.01	100 Piece(s)	728973
	V.02	100 Piece(s)	728974

6.1.5 Locking components

Striker, 8 mm installation height

(for an unfavourable sash turning curve)



				Nº
	V.01	8	100 Piece(s)	728917
	V.02	8	100 Piece(s)	728919

[2] FM-Sh multi-ported striker, compl.

for FM-SuN and FM-Sh



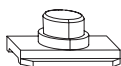
		Nº
FM-Sh multi-ported striker, compl.	100 Piece(s)	728961

6.2 Espagnolette and connector

6.2.1 Geared-handle

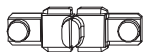
[22] Connector bolt, insertable

SW < 1300 mm



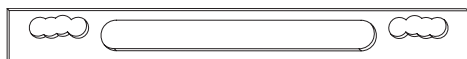
			Nº
Insertable connector bolt	For Roto Line AL geared-handle	100 Piece(s)	254601

[8] T connector



		Nº
T connector	10 Piece(s)	334754

[10] Espagnolette support



				Nº
Espagnolette support	For Roto Line AL geared-handle	13.5	100 Piece(s)	331937

[14] SEC espagnolette protection

for geared-handle, lockable



			Nº
SEC espagnolette protection	For Roto Line AL geared-handle	10 Piece(s)	487407



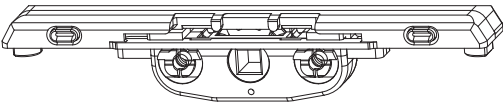
INFO

Also order the SEC connector → *from page 166.*



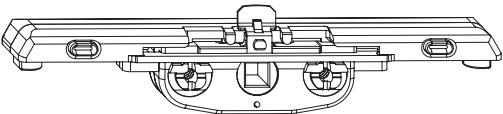
6.2.2 Flush-encased gearbox

Flush-encased gearbox without blocking device



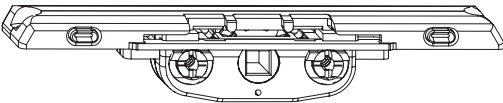
				Nº
Flush-encased gearbox without mishandling device	24 mm	Coupling point, 10 mm	10 Piece(s)	378338

Flush-encased gearbox with blocking device



				Nº
Flush-encased gearbox with mishandling device	24 mm	Coupling point, 10 mm	50 Piece(s)	378337

SEC flush-encased gearbox without blocking device



				Nº
SEC flush-encased gearbox AL without mishandling device	24 mm	Coupling point, 10 mm	10 Piece(s)	457210



INFO

Also order the SEC connector → *from page 166.*

SEC rebate-clearance reduction ESP

for SEC flush-encased gearbox



			Nº
SEC rebate-clearance reduction ESP	For Roto Line lock. handles	50 Piece(s)	334360

Large packaging for individual components
Espagnolette and connector
Floating-mullion espagnolette

SEC drilling protection

for SEC flush-encased gearbox



			Nº
SEC drilling protection	For Roto Line lock handles	10 Piece(s)	487406

6.2.3 Floating-mullion espagnolette

[59] Toggle lever, compl.

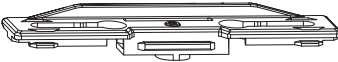
for FM-SuN



		Nº
Toggle lever, compl.	100 Piece(s)	379013

[60] Guide rail, compl.

for FM-SuN



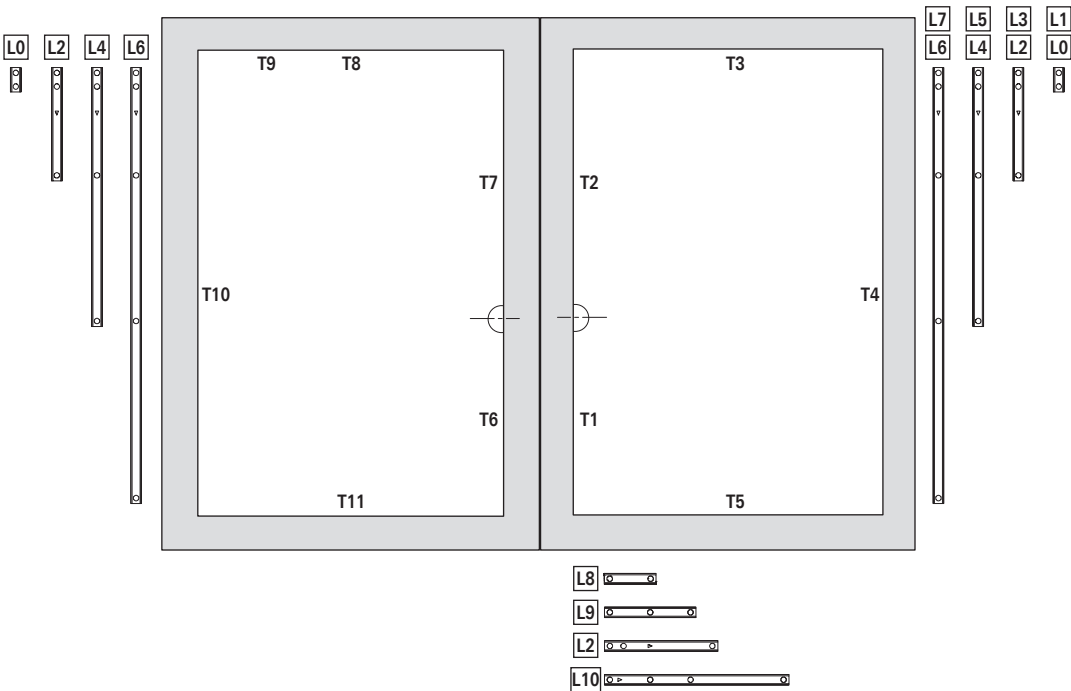
		Nº
Guide rail, compl.	10 Piece(s)	634348



6.3 Accessories

6.3.1 Connecting rods

Connecting rod fixed dimensions



On the hinge side (T4 / T10)

SH	T&T			TF / TiSs		T-O		TiSt	Floating mullion
	80 kg	150 kg	180 kg	150 kg	80 kg ^[11]	150 kg	180 kg ^[12]	100 kg	150 kg
≤ 1300	L0	L0	L0	L0	L1	–	L0	–	L0 (2x)
1301 – 1800	L2	L2	L2	L2	L3	–	L2	–	L2 (2x)
1801 – 2400	L4	L4	L4	L4	L5	–	L4	–	L4 (2x)
> 2400	–	L6	L6	L6	L7	–	L6	–	L6 (2x)

Horizontal at the bottom (T5)

SW	T&T			TF / TiSs		T-O		TiSt	Floating mullion
	80 kg	150 kg	180 kg	150 kg	80 kg	150 kg	180 kg	100 kg	150 kg
≤ 1300	–	–	L9	L8	–	–	–	–	–
> 1300	–	L2	L10	L10	–	L10	L10	–	–

					Nº
L0	45	–	555 – 1300	10 Piece(s)	729978
L1	61	–	520 – 1300	10 Piece(s)	781770
L2	536	–	1301 – 1800	10 Piece(s)	729979
L3	552	–	1301 – 1800	10 Piece(s)	781771
L4	1206	–	1801 – 2400	10 Piece(s)	729980
L5	1222	–	1801 – 2400	10 Piece(s)	781772
L6	1876	–	2401 – 3000	10 Piece(s)	729981
L7	1892	–	2401 – 3000	10 Piece(s)	781773
L8	95	405 – 1300	–	10 Piece(s)	729982
L9	170	735 – 1300	–	10 Piece(s)	772751
L10	606	1301 – 1600	–	10 Piece(s)	769015

[11] Couplable with rebate sash stay

[12] With sash stay 735

Large packaging for individual components

Accessories

SEC connector



INFO

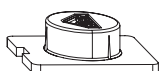
All other connecting rod lengths can be found in the corresponding installation drawings → *from page 248.*

Connecting rods (yard goods, also for ECC-groove)



				Nº
3 m connecting rod	ECC-groove	1 Piece(s)		735102
Connecting rod, 6 m	ECC-groove	1 Piece(s)		334665

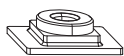
Roto Clip



				Nº
	Roto Clip for free holes in connecting rods	100 Piece(s)		331288

6.3.2 SEC connector

for SEC corner drive CL, SEC espagnolette protection, SEC flush-encased gearbox



				Nº
	SEC connector	100 Piece(s)		447113

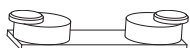
6.3.3 SEC rebate-clearance reduction CD

for corner drive, on the locking side, top



				Nº
	SEC rebate-clearance reduction CD	50 Piece(s)		447112

6.3.4 SEC coupler component



For connecting two connecting rods.

				Nº
	SEC coupler component	20 Piece(s)		348576

6.3.5 Reducing sleeve

Adapting mount Ø 6 mm to mount Ø 10 mm





		Nº
Reducing sleeve from Ø 6 to Ø 10 mm	100 Piece(s)	334352

6.3.6 Screws

6.3.6.1 Countersunk screws

Countersunk screw ST4.8 x 16

For SEC rebate-clearance reduction CD / ESP



			Nº
Countersunk screw	ST4,8x16	100 Piece(s)	728932

[17] Countersunk screw M5 x 7

for SEC corner drive CL



			Nº
Countersunk screw	M5x7	100 Piece(s)	728928

[30] Countersunk screw M5 x 10

for SEC espagnolette protection



			Nº
Countersunk screw	M5x10	100 Piece(s)	728926

Countersunk screw M5 x 30

for securing the handle in the flush-encased gearbox



			Nº
Countersunk screw	M5x30	100 Piece(s)	212501

6.3.6.2 Cylinder screws

Cylinder screw M5 x 8

for SEC flush-encased gearbox



			Nº
Cylinder screw	M5x8	100 Piece(s)	728936

[9] Cylinder screw M5 x 12

for T connector



				Nº
	Cylinder screw	M5x12	100 Piece(s)	728925

6.3.7 Roto NX grease

			Nº
Roto NX grease	20 ml tube, white	1 Piece(s)	782881



7 Large packaging for sets

7.1 Locking components

7.1.1 Tilt-Only hardware

TiSt Tilt-Only stay arm set

for TiSt | 100 kg

		Nº
V.01	20 Piece(s)	728862
V.02	20 Piece(s)	728863

Contents:

Figure	Quantity	Description
	1	[61] Tilt-Only stay arm, compl.
	1	[62] Slide bar, compl.

7.1.2 Floating-mullion hardware

[*] Multi-ported striker set

for FM-Su and FM-R

		Nº
VB 1/2	20 Piece(s)	728912
VB 3/4	20 Piece(s)	728913
VB 5/6	20 Piece(s)	728914

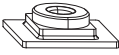
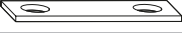
Contents:

Figure	Quantity	Description
	1	[2a] Multi-ported striker bottom part
	1	[2b] Multi-ported striker top part

Coupler component set

			Nº
Coupler component set	For coupling a connecting rod	100 Piece(s)	728856

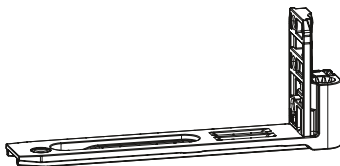
Contents:

Figure	Quantity	Description
	2	[16] SEC connector
	1	[67] SEC coupler component, plate
	2	[68] Washer
Not sh.	2	[69] Cylinder screw M5 x 6

7.2 Hinge side

7.2.1 Corner hinge set

With increased fixing



   	Adjustment piece with increased fixing for profile systems which feature embossing of the corner connector in the area of the fixing		
	Left	10 pieces	769855
	Right	10 pieces	769494

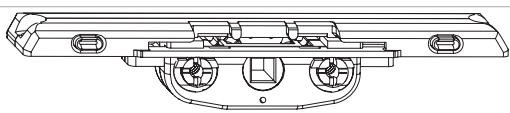
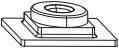
7.3 Espagnolette and connector

7.3.1 Flush-encased gearbox

[8a] SEC flush-encased gearbox set

		
SEC flush-encased gearbox set	10 Piece(s)	728947

Contents:

Figure	Quantity	Description
	1	SEC flush-encased gearbox without blocking device
	2	SEC connector
Not sh.	2	Cylinder-head screw M5 x 8
	1	SEC drilling protection
	1	SEC rebate-clearance reduction flush-encased gearbox
Not sh.	1	Countersunk screw ST4.8 x 16

7.3.2 Floating-mullion espagnolette

for FM, couplable

FM SEC espagnolette set

Can be used in RC tests depending on the profile.



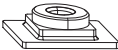
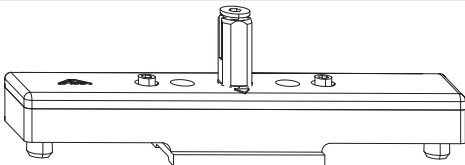
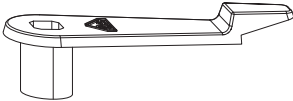
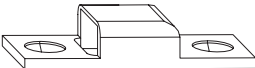
INFO

Pay attention to the profile assessment.



		Nº
FM SEC espagnolette set	1 Piece(s)	764284

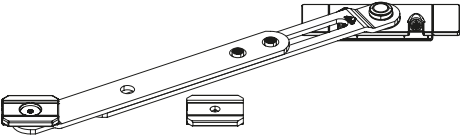
Contents:

Figure	Quantity	Description
	2	SEC connector
	1	FM espagnolette, internal
	1	Operating lever, routed
	1	SEC lock
	2	Reducing sleeve
Not sh.	2	Countersunk screw M5 x 7

7.4 Accessories

7.4.1 Turn restrictor

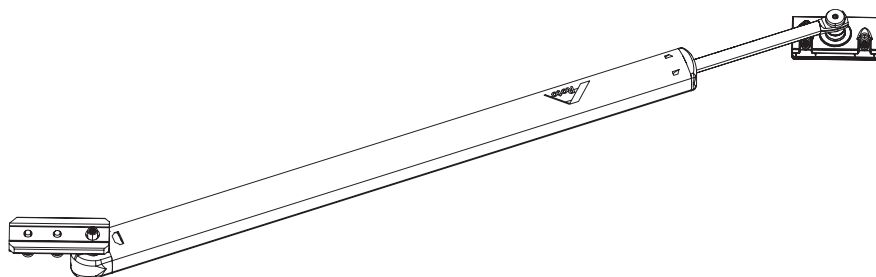
Turn restrictor set, with stop (stainless steel)



			Nº
Clampable	V.01	10 Piece(s)	2004506

Large packaging for sets
Accessories
 Turn locks

Turn restrictor set, braked, damped



				Nº
Clampable	Size 1	V.01	10 Piece(s)	774487
		V.02	10 Piece(s)	774484
	Size 2	V.01	10 Piece(s)	774495
		V.02	10 Piece(s)	774496

Contents:

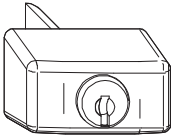
Figure	Quantity	Description
Not sh.	1	Turn restrictor, compl.
Not sh.	1	Mushroom-head thread
Not sh.	1	Frame bearing, compl.

7.4.2 Turn locks

Turn lock set

			Nº
R01.1	Natural silver	20 Piece(s)	728815
R01.5	Silver	20 Piece(s)	728816
R05.4	Dark bronze	20 Piece(s)	728817
R06.2M	Jet black, matt	20 Piece(s)	210866
R07.1	Pure white	20 Piece(s)	728818
R07.2	Traffic white	20 Piece(s)	728819
SF	Special colour	20 Piece(s)	728820

Contents:

Figure	Quantity	Description
	1	Turn lock, compl. with cylinder lock
	1	Key
Not sh.	2	Cylinder screw M5 x 12



Set of keys

		Nº
Replacement key	10 Piece(s)	208248

Contents:

Figure	Quantity	Description
	2	Key
Not sh.	1	Key ring

Locking plate set

		Nº
Locking plate set	100 Piece(s)	728916

Contents:

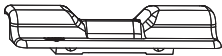
Figure	Quantity	Description
	1	Locking plate
Not sh.	2	Countersunk screw ST4.8 x 16

Upgrade set

for turn lock

		Nº
Upgrade set for turn lock	10 Piece(s)	684284

Contents:

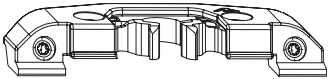
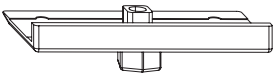
Figure	Quantity	Description
	1	Locking plate
	1	Multi-ported striker, compl.

7.4.3 Bullet catch

Bullet-catch set

		Nº
Bullet catch set	10 Piece(s)	2000398

Contents:

Figure	Quantity	Description
	1	Bullet catch, compl.
	1	Bullet-catch cam, compl.
Not sh.	1	Self-tapping screw ST3.9 x 25

Bullet-catch cam packer

for horizontal installation in floating-mullion elements in the second opening sash



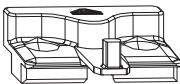
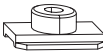
		Nº
Bullet-catch cam packer	10 Piece(s)	2000404

7.4.4 Night vent

Night-vent set

		Nº
Night vent set	10 Piece(s)	728958

Contents:

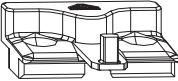
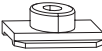
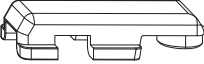
Figure	Quantity	Description
	1	Night vent
	1	Night vent locking cam
	1	Coupler component
Not sh.	1	Countersunk screw M5 x 10
Not sh.	2	Self-tapping screw ST3.9 x 25

Night-vent set for T&T additional stay arm | 130 kg

		Nº
Night vent set for T&T additional stay arm 130 kg	10 Piece(s)	810364

Contents:



Figure	Quantity	Description
	1	Night vent
	1	Night vent locking cam
	1	Coupler component
	1	Connecting rod
	1	Additional stay arm coupler component
Not sh.	1	Countersunk screw M5 x 10
Not sh.	2	Self-tapping screw ST3.9 x 25

7.4.5 Screws

7.4.5.1 Rivet nut set

Application range: thread engagement ≤ 6 mm



		Nº
Rivet nut set, metric	10 Piece(s)	793407

Contents:

Figure	Quantity	Description
	1	Rivet nut M5 x 12
Not sh.	1	Countersunk screw M5 x 16

8 Installation

8.1 Processing instructions

Maximum sash sizes and weights

The specifications, application diagrams and component assignments which can be found in the hardware manufacturer's product-specific documents provide information on the maximum permitted sash sizes and weights. The component with the lowest permitted load bearing capacity determines the maximum permitted sash weight.

- Before using electronic data records and implementing them in window fabrication programs in particular, check that they match the specifications, application diagrams and component assignments.
- Never exceed the maximum permitted sash sizes and weights. If any points are unclear, contact the hardware manufacturer.

Specifications from profile manufacturers

The element manufacturer must comply with all specified system dimensions (e.g. gasket gap dimensions or locking distances).

They must continue to ensure and check this on a regular basis, especially when new hardware components are used for the first time, during production and on a continuous basis, up to and including element installation.



INFO

The hardware components are always designed in such a way that any system dimensions affected by the hardware can be adjusted. The hardware manufacturer shall not be liable for any additional expenses incurred if a deviation from these dimensions is not discovered until after the element has been installed.

Combining hardware

Burglar-inhibiting elements need hardware which meets special requirements.

Elements for wet rooms and those for use in environments with aggressive, corrosive constituents in the air require hardware that meets special requirements.

The resistance of elements to wind loads when they are closed and locked depends on the individual design of the element. The hardware system is capable of handling wind loads specified by legislation and standards (for example in accordance with EN 12210 – especially test pressure P3).

Coordinate suitable hardware combinations and installation procedures in elements with the hardware manufacturer and profile manufacturer for the areas listed above, and conclude a separate agreement for them.



INFO

The hardware manufacturer's specifications on the combination of hardware (e.g. the use of additional scissor stays, the design of hardware for burglar-inhibiting elements, etc.) are binding.

In general, the hardware defined in this document is capable of meeting statutory and normative requirements for accessible dwellings.

Installation surfaces

The frame and sash grooves must be free from construction materials (such as plaster, gypsum). The sash groove must be free from welding residue to ensure an optimum supporting surface for the hardware components.



8.2 Screw connections



DANGER

Incorrectly installed or screwed-in hardware components present a risk of death.

Incorrectly installed and screwed-in hardware components may lead to hazardous situations and cause serious or fatal accidents.

- ▶ During installation and screwdriving work, observe the specifications provided by the profile manufacturer; contact the profile manufacturer if necessary.
- ▶ Use the recommended screws.
- ▶ Select the length of the screws according to the profiles used.
- ▶ Ensure that the hardware components are adequately secured; contact the screw manufacturer if necessary.



ATTENTION

Using incorrect screw material may cause property damage.

Using the wrong screws may damage the components.

- ▶ Only use galvanised zinc-plated and passivated steel screws.
- ▶ Use screws with additional sealing in more challenging climatic conditions.
- ▶ Use stainless-steel screws on stainless-steel components only.
- ▶ For aluminium components, use screws made of steel (coated with zinc-nickel or zinc flakes) or stainless steel.



ATTENTION

Improper screw fixings may cause property damage.

Improper screw fixings may damage the components and the element as a whole, and stop them from working properly.

- ▶ Unless stated otherwise, turn screws in straight.
- ▶ Tighten screw heads until they are flush with the surface.
- ▶ Do not over-tighten screws. Note the torque. Choose a torque that will not deform the hardware and profile. Define profile-specific torques on the basis of the demo assembly.
- ▶ Use the recommended screws.
- ▶ Select the length of the screws according to the profiles used.

Fasten hardware components with the screws supplied. Observe the screwdriving specifications while doing so → *from page 177.*

8.2.1 Screw-fixing specifications for aluminium profiles



WARNING

Incorrect screw connections may pose a risk of death!

Hardware components can be pulled out of the profile if they are not screwed down correctly.

- ▶ Select the length of the screws so that they will hold in the aluminium profile.
If necessary, insert additional aluminium profiles or use rivet nuts.



INFO

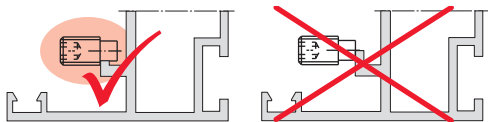
Without examining the corner connectors used, Roto is unable to make any statements about the suitable fastening options.

Components	Components	Size	Quantity	d _k	Diameter to be drilled	Drive
SEC striker for tilt ventilation	Tamper-proof screw	M5 x ...	2	–	–	–
CL sash component	Threaded pin	–	–	–	–	T10
Tilt-Only stay arm hinge track						
CL frame component						

The type and quality of the screw fixing always depend on the aluminium profile used by the profile manufacturer and must be inspected before use (system assessment).

Other AL hardware components are usually fastened to the frame and sash by clamping. Specific tightening torques apply during installation. Please note the relevant information on this in the chapter entitled "Installation".

Screw fixings with piercing screws



Tamper-proof screws

A preliminary system assessment is required to ensure that the components are sufficiently secured in the profile.

8.3 Preparing for installation

8.3.1 Preparing the connecting rods

Cropping



INFO

All connecting rod dimensions refer to an overlap width of 22 mm.

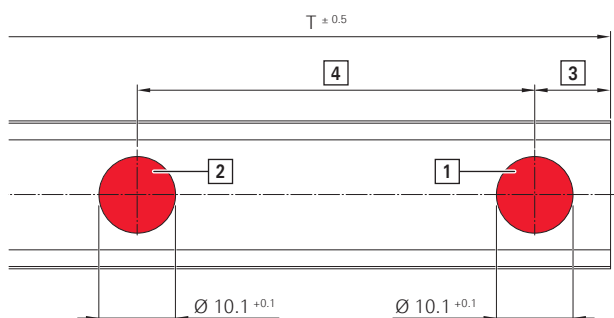
If the overlap width differs from this, adapt the connecting rod dimensions accordingly.

All connecting rod dimensions $T \pm 0.5$ mm.

1. For the length of the connecting rods, see the installation drawing. → *from page 248*
2. Mark the length on the connecting rods.
3. Crop the connecting rods.

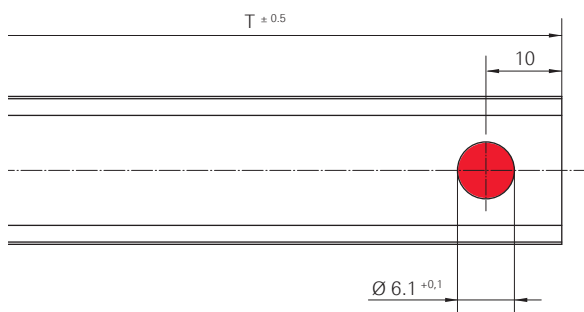
Drilling / punching

General dimensioning of all coupling points (except for the floating mullion), unless otherwise specified.

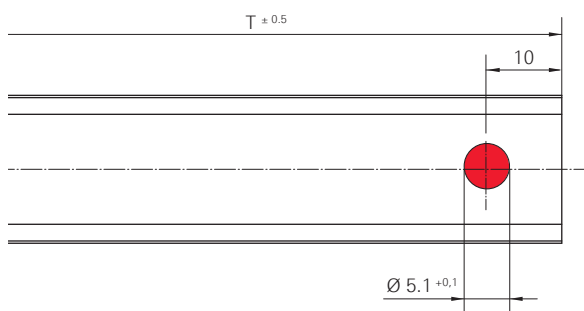


Position	Description
[1]	Drill hole for coupling point of various components / cam
[2]	Drill hole for cam / TF tilt lock bolt
[3]	Distance dimension from outside = 10 mm Except for CR4 and CR5 with RC 3: 50 mm
[4]	Distance dimension to the next cam / TF tilt lock bolt

Dimensioning of the floating-mullion espagnolette coupling points (except for FM-SuN), unless otherwise specified.



Dimensioning of the FM-SuN espagnolette coupling points, unless otherwise specified.



INFO

Connecting rods from the Roto product range cannot be used. Narrower connecting rods are required.

1. For the position of the coupling points, cams and TF tilt lock bolt in connecting rods, see the installation drawing.
 → *from page 248*
2. Drill holes.

Slot for accessories

1. Locking sleeve: produce the slot in the connecting rod → *from page 224* → *from page 198*.
 Bullet-catch cam: produce the slot in the connecting rod → *from page 293*.

8.3.2 Opening the sash corners



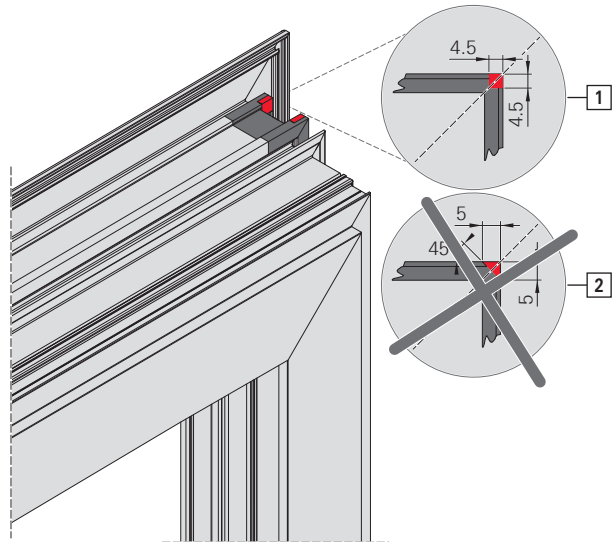
Installation

Preparing for installation

Corner drive CL – ECC-groove

1. Open the connecting rod groove at all sash corners.

Position	Description
[1]	Connecting rod groove opening
[2]	Alternative connecting rod groove opening not possible.

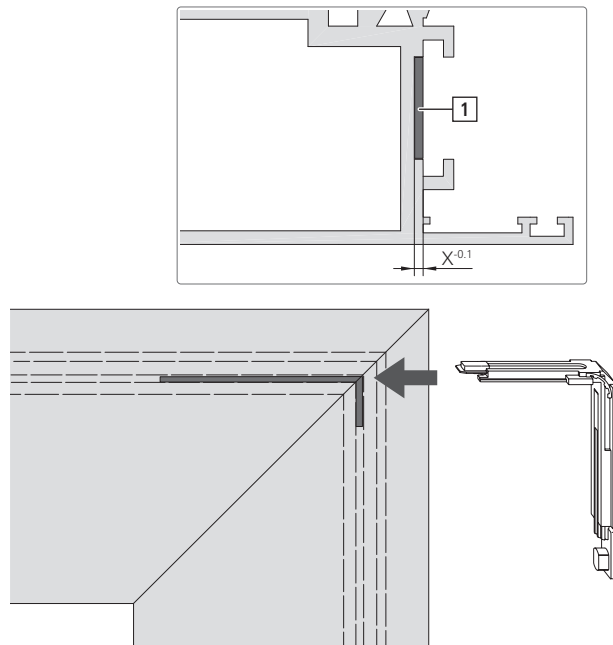


2. Deburr the edges.

8.3.3 Corner drive CL – ECC-groove

Placing supports under the corner drive CL – ECC-groove

1. When the corner drive CL is used in a profile with extended connecting rod groove (ECC), use a profile-related bracket [1] as a packer. Dimension X must not be greater than the groove depth.



8.3.4 Connecting the coupling points



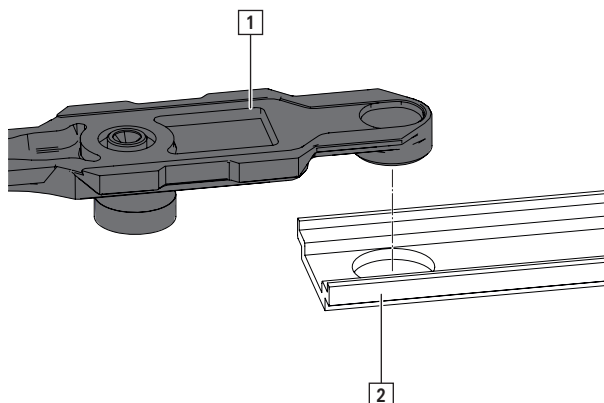
INFO

Prepared connecting rods always have coupling points.



Connecting the corner drive to the connecting rod

1. Connect the corner drive [1] at the coupling point on the connecting rod [2].

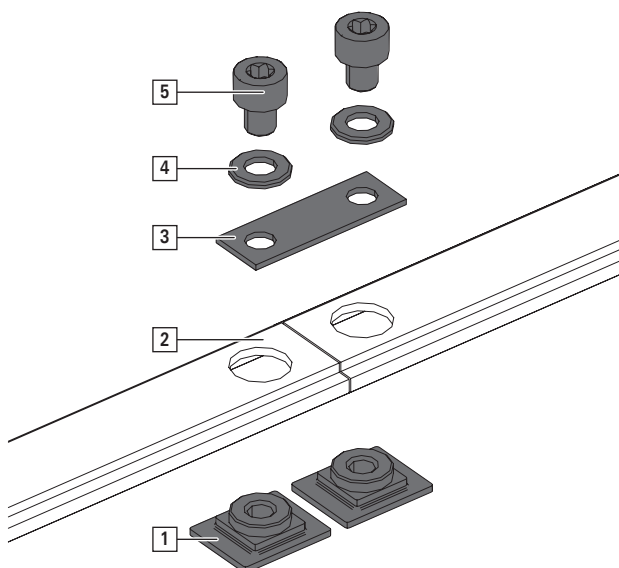


Connecting the connecting rods with the coupler component set

1. Insert the SEC connectors [1] into the connecting rods [2] at the coupling point.
Connect the SEC connectors to the plate [3].
Fit one washer [4] per SEC connector.
Fasten the SEC connectors with one cylinder screw [5] each.

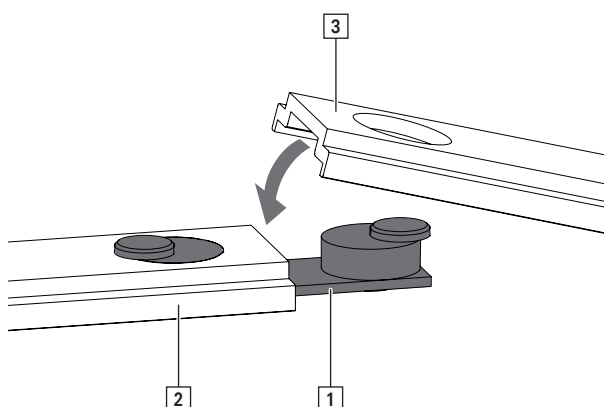
Tool: T25 hexalobular socket screwdriver

Torque: 1.5 – 2.0 Nm



Connecting the connecting rods with the SEC coupler component

1. Use the SEC coupler component [1] at the coupling point on a connecting rod [2].

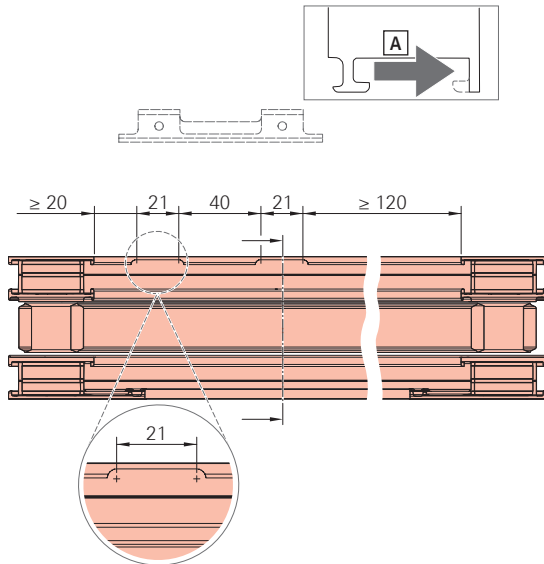


2. Connect the unit to another connecting rod [3] at the coupling point.

8.4 General installation

8.4.1 Drilling and routing dimensions

8.4.1.1 Sash stay 390



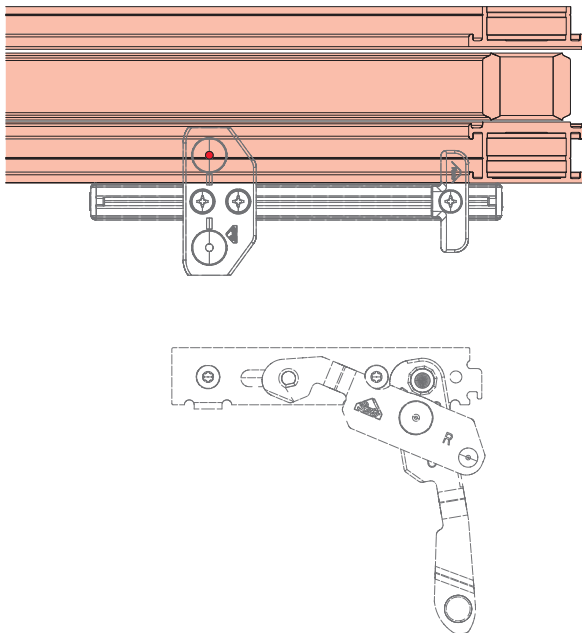
Open the frame profile by 21 mm to insert the sash stay clamp strip. Route the profile strut so that it is flat [A].



INFO

Do not perform routing work if the clamp strip for sash stay 390 has already been placed in the frame.

8.4.1.2 Pivot rest / stay bearing



Place the drilling jig on the frame as shown in the drawing.

Drill holes:

1 x Ø 2.5 mm, at least 4 mm deep.



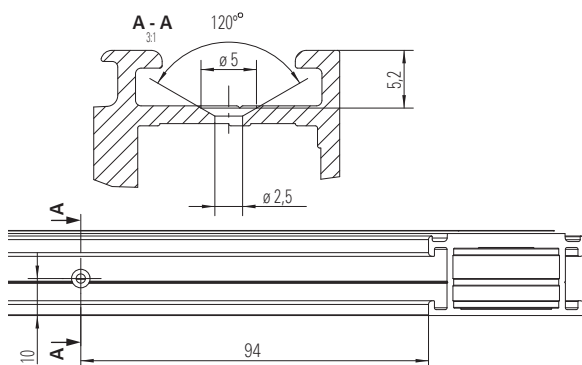
INFO

Drill holes if:

- The punched hole produced by the screw is not sufficient.
- The base of the groove is too thick (> 2 mm).

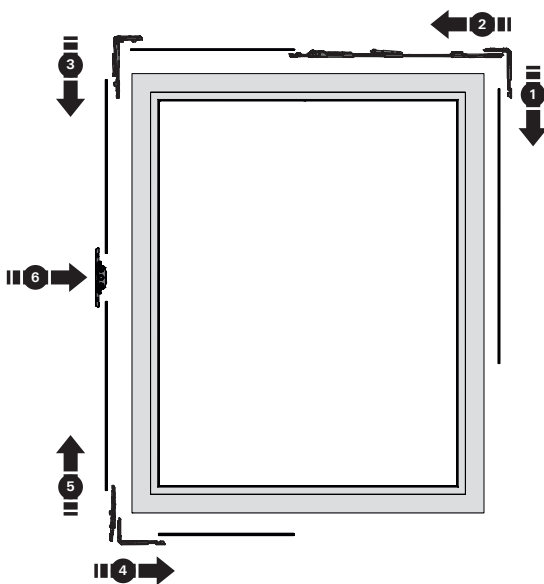


Alternative (for mechanical production):
Drill the hole according to the drawing.



8.4.2 Sash

8.4.2.1 Installation sequence



- [1] Connecting rod on the hinge side
- [2] Horizontal top connecting rods and components
- [3] Top connecting rods and components on the locking side
- [4] Horizontal bottom connecting rod and components
- [5] Bottom connecting rods and components on the locking side
- [6] Espagnolette on the locking side

Observing the installation sequence

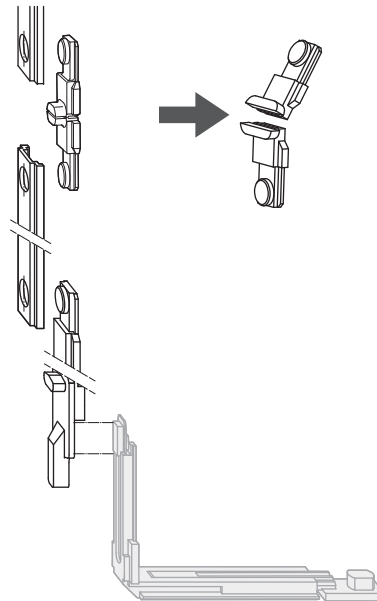
1. Open the sash corners .
2. Crop and drill the connecting rods → *from page 178*.
3. Install the insertable cam → *from page 187*.
4. Install the connecting rod on the hinge side .
5. Install the horizontal top connecting rods and components .

6. Install the connecting rods and espagnolette on the locking side .
7. Install the horizontal bottom connecting rod and components .
8. Install the handle → *from page 239*.

8.4.2.2 T connector

Installing the T connector

1. When using the centre lock, break the lower horizontal T connector in the centre and insert it from above or below.



8.4.2.3 Connector bolt, insertable

for Roto Line AL geared-handle

Installing the connector bolt, insertable



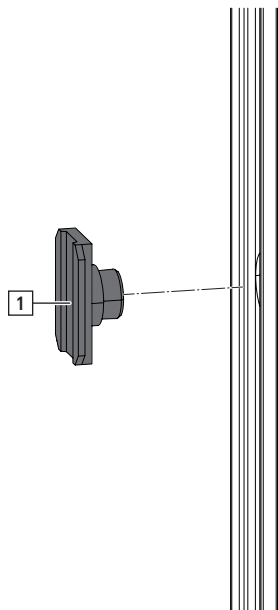
INFO

Comply with the installation sequence for the aluminium sash .

1. For the position of the connector bolt, see the installation drawings → *from page 248*.
2. Connecting the corner drive to the connecting rod at the coupling point → *from page 188*
Install the cam → *from page 187*.



3. Insert the connector bolt [1] into the continuous connecting rod.



4. Insert everything jointly into the connecting rod groove from above on the locking side.
5. Fix the corner drive to the sash using the retaining fork → *from page 188*.

8.4.2.4 SEC espagnolette protection

for Roto Line AL lockable geared-handle

Installing the SEC espagnolette protection

⇒ The Roto Line AL geared-handle, lockable, is installed → *from page 240*.



INFO

Comply with the installation sequence for the aluminium sash .

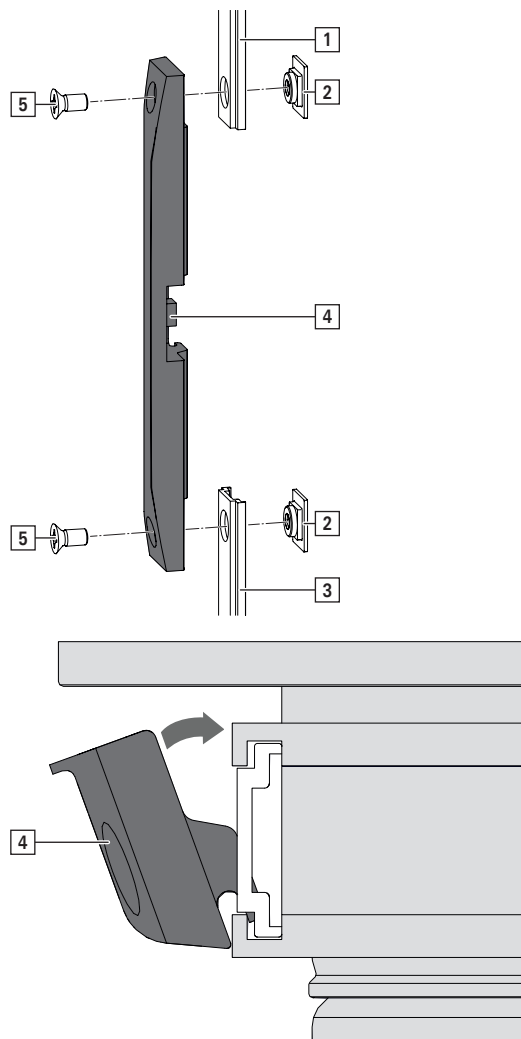
1. For the position of the SEC espagnolette protection, see the installation drawings → *from page 248*.
2. Install the Roto Line AL geared-handle, lockable, with espagnolette support → *from page 240*.



INFO

It is not possible to install the espagnolette support at a later point.

3. Screw down the SEC espagnolette protection onto the connecting rods as follows.
 - a. Insert the corner drive with connecting rod [1], SEC connector [2] and cam into the connecting rod groove from above on the locking side.
 - b. Insert the connecting rod [3], SEC connector [2] and cam into the connecting rod groove from below on the locking side.
 - c. Swing the SEC espagnolette protection [4] into the connecting rod groove on the locking side.
 - d. Fasten the SEC espagnolette protection on the connecting rods to the SEC connectors using screws.



4. Fix the corner drive to the sash using the retaining fork → *from page 188*.

8.4.2.5 Flush-encased gearbox

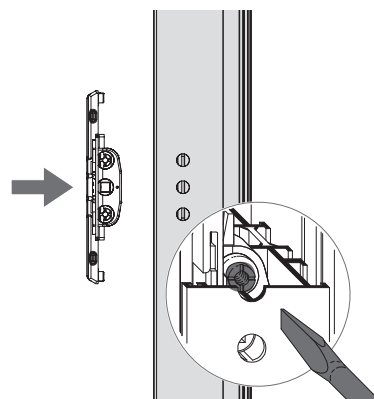
Installing the flush-encased gearbox

1. For the position of the flush-encased gearbox, see the installation drawings. → *from page 248*
2. Place the flush-encased gearbox in the delivery state in the routing provided as shown.



INFO

Turn the clampable lug to secure the flush-encased gearbox for transport.





8.4.2.6 Cam, insertable – Euro-groove

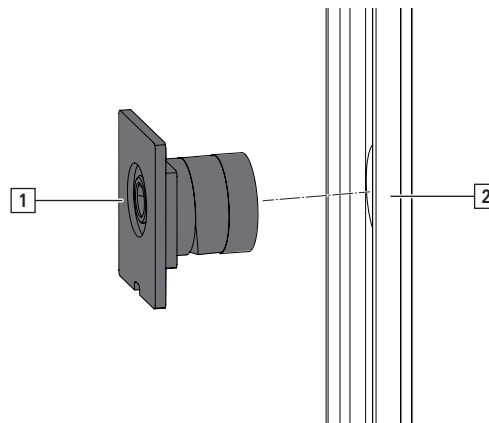
Installing the cam, insertable



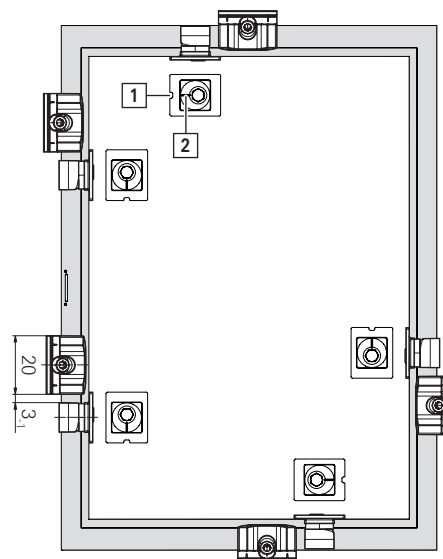
INFO

Comply with the installation sequence for the aluminium sash .

1. For the number and position of cams, see the installation drawings. → *from page 248*
2. Insert the cam [1] into the connecting rod [2].



- a. The recess [1] on the cam points away from the striker.



- b. Adjust the marking [2] for adjusting the cam horizontally or vertically in relation to direction of travel
 → 10.1.1 "Cam, insertable" from page 296.

8.4.2.7 Cam, insertable – ECC-groove

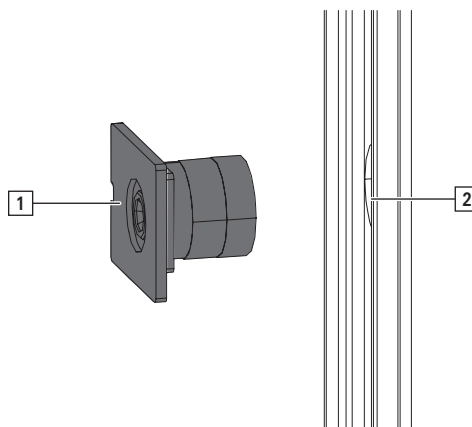
Installing the cam, insertable – ECC-groove



INFO

Comply with the installation sequence for the aluminium sash .

1. For the number and position of cams, see the installation drawings. → *from page 248*
2. Insert the cam [1] into the connecting rod [2].



- a. The recess [1] on the cam points either towards the sash overlap or away from the sash overlap at every position.

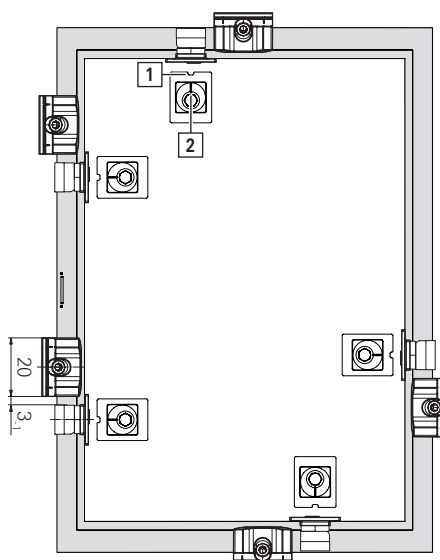


INFO

Depending on the alignment of the cam, it is now only possible to increase or reduce the gasket compression.

The recess points towards the sash overlap = reduce the gasket compression.

The recess points away from the sash overlap = increase the gasket compression.



- b. Adjust the marking [2] for adjusting the cam horizontally or vertically in relation to direction of travel
 → 10.1.1 "Cam, insertable" from page 296.

8.4.2.8 Corner drives

Installing the corner drives

- ⇒ Drill holes created in the handle → *from page 182*
- ⇒ Espagnolette cutout routed → *from page 182*
- ⇒ Sash corners opened
- ⇒ Connecting rods prepared → *from page 178*
- ⇒ Cam installed → *from page 187*

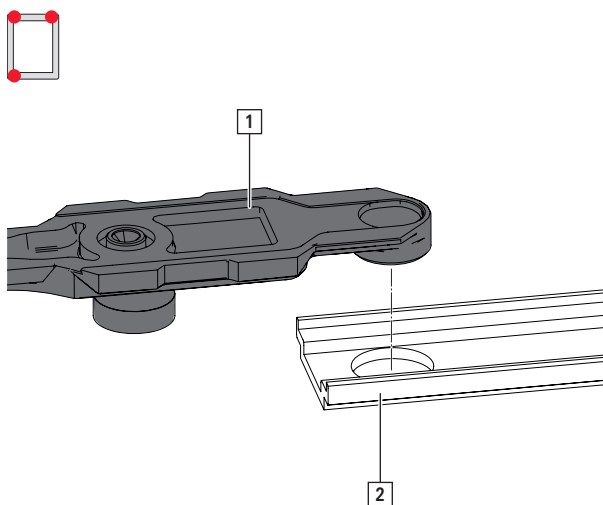


INFO

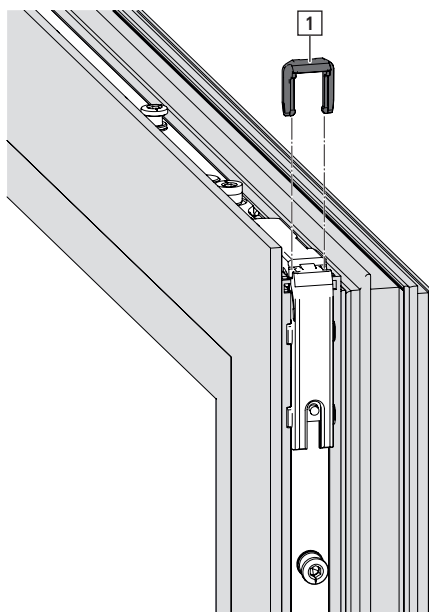
Comply with the installation sequence for the aluminium sash .



1. Connect the corner drive [1] to the connecting rod [2] and additional components at the coupling point.



2. Insert everything jointly into the connecting rod groove.
3. Fix the corner drive to the sash using the retaining fork [1].



8.4.3 Frame



INFO

Install the frame components when the frame is horizontal (workshop).

Once the frame is fitted, the reveal may prevent frame components from being installed correctly.

8.4.3.1 Strikers

Position the strikers in accordance with the installation drawings or using positioning jigs → *from page 155*.

Striker positions in installation drawings correspond to cams in the turned, open position (T&T / T-O / FM) and tilted, open position (TF / TiS).

Test distance from (standard / SEC) striker to cam

- 3₋₁ mm in turned, open position (T&T^[13] / T-O / FM) and tilted, open position (TiS)
- 20.5₋₁ mm in turned, open position (TF)

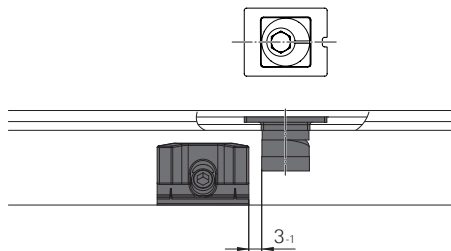


INFO

Check all dimensions during sample installation prior to series production.

Installing standard strikers

1. Determine the striker position.

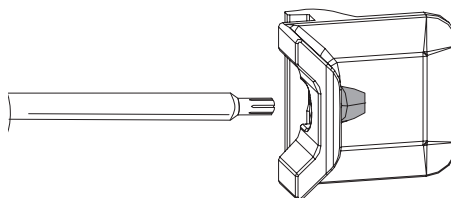


2. Fasten the striker with a preassembled threaded pin.

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm

Check that the striker is fitted securely.



Installing standard strikers as centre locks

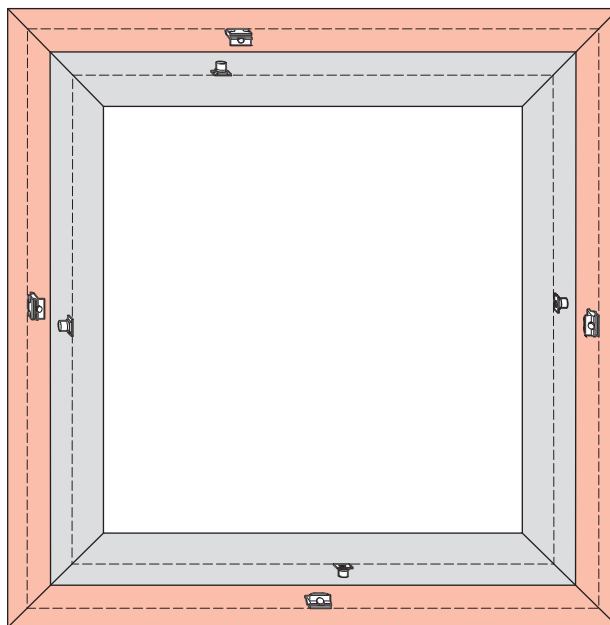
1. Place centre locks horizontally and vertically from SW or SH > 1300 mm.

Depending on the profile stability and leaktightness requirements, the centre locks may have to be positioned at smaller sash widths and lower sash heights.



INFO

From 0.5 kN/m² wind load or SH > 1800 mm, place additional centre locks on the hinge side and locking side.



[13] T&T | accessible: align in the centre, see *Installing strikers (accessible)*



Installing SEC strikers

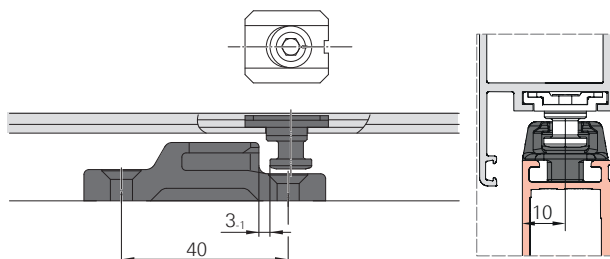
1. Determine the striker position.



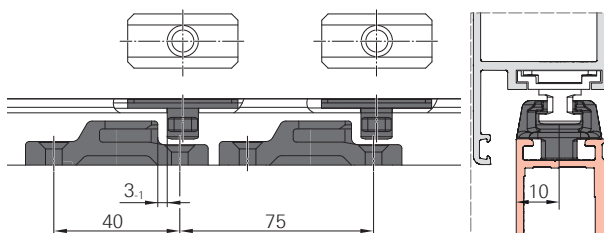
INFO

Security locking points must not collide with standard locking points.

RC 2



RC 3



2. Fasten the SEC striker with two screws.
Check that the striker is fitted securely.

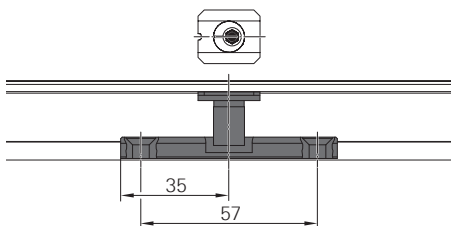


INFO

It must be ensured that the SEC strikers are securely fitted (in accordance with RC classification) for security hardware.

Installing strikers (accessible)

1. Determine the striker position.
Align the striker and cam in the centre.



2. Fasten the striker with two screws.



INFO

Select screws on the basis of the threshold structure. Observe the specifications on selecting the screw head while doing so. Countersink the screw head completely.

Check that the striker is fitted securely.

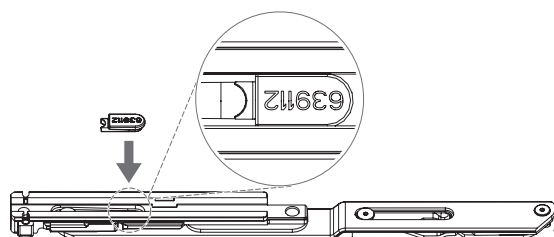
8.5 Tilt&Turn / TiltFirst / Tilt-Only hardware, handle at the side

8.5.1 Sash

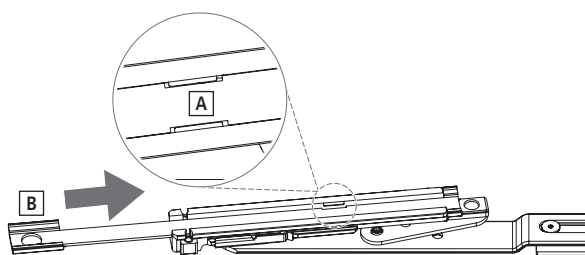
8.5.1.1 Sash stay 390 | SH ≤ 800 mm

Preassembling sash stay 390

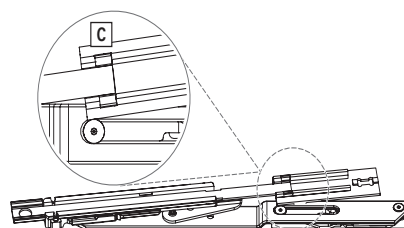
1. Use a tilt distance restrictor for elements with SH ≤ 800 mm.



2. Crop and punch the coupling rod. Open the sash stay and insert the coupling rod at the height of the guide lugs [A]. Insert the coupling rod as far as it will go [B].

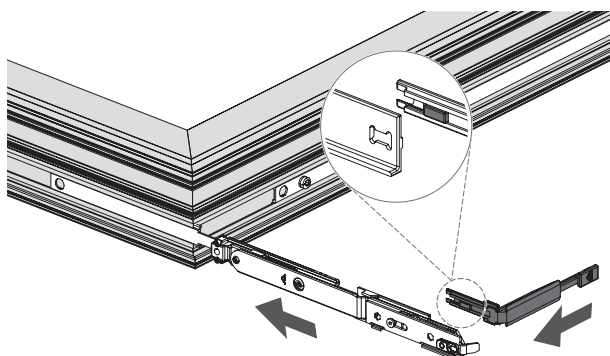


3. Insert the control component into the coupling rod as shown [C].



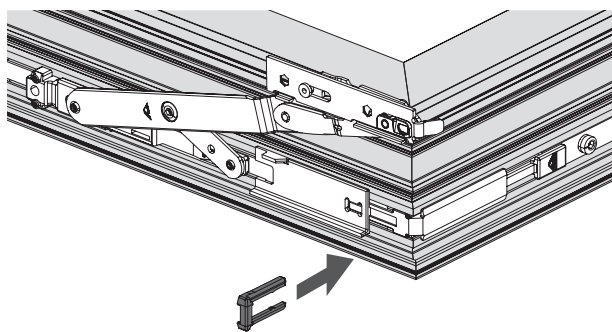
Installing sash stay 390

1. Insert connecting rod CR4 with components (according to the installation drawing) in the Euro-groove on the hinge side.
2. Link the CL corner drive to the sash stay and insert the entire assembly at the top, starting from the hinge side. Link connecting rod CR4 to the CL corner drive.

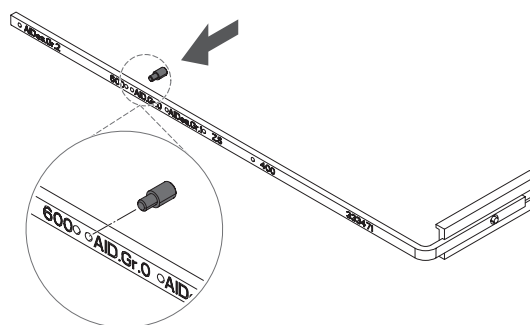




- Slightly open the sash stay and secure the CL corner drive with the retaining fork.



- Prepare the jig for the sash stay by fitting the positioning pin in the corresponding drill hole.
Sash stay 390 = AID. size 0



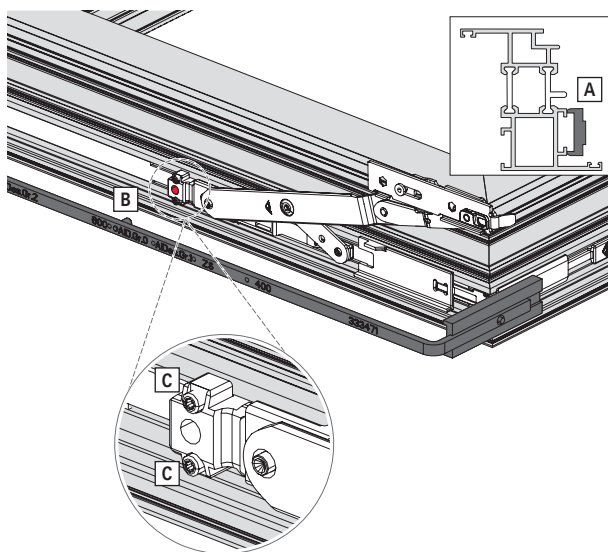
- Position the jig on the Euro-groove so that it is level [A].

Open the sash stay and insert the jig positioning pin into the sash stay hole provided [B].

Fix the sash stay in position with two piercing screws [C].

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm

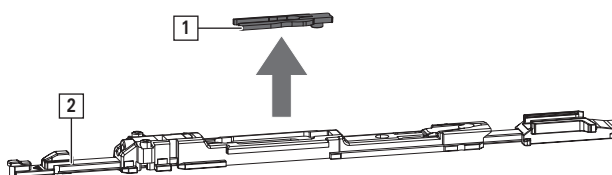


8.5.1.2 Tilt distance restrictor

For SH ≤ 800 mm or a reduced tilt distance

Installing the tilt distance restrictor in scissor stay guide 500

- Remove the preassembled spring clip [1] from the scissor stay guide [2].

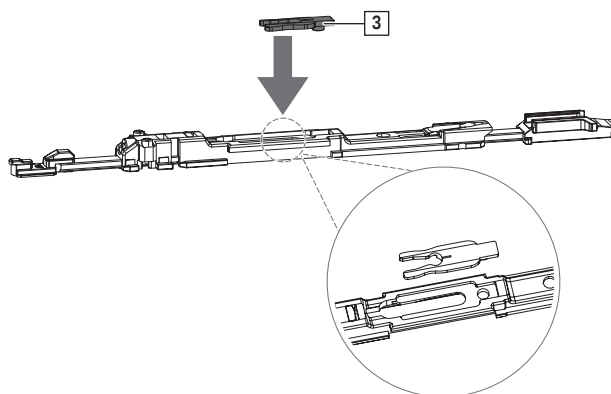


Installation

Tilt&Turn / TiltFirst / Tilt-Only hardware, handle at the side

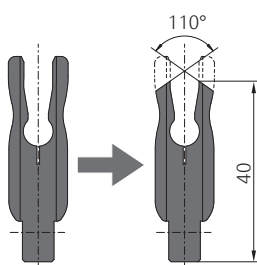
Sash

2. Insert the tilt distance restrictor [3] instead.

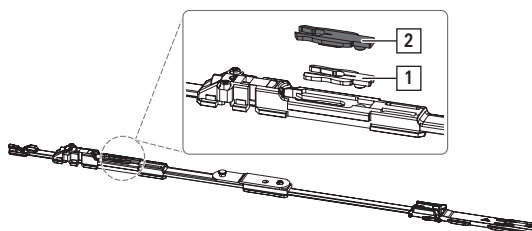


Installing the tilt distance restrictor in scissor stay guide 735

1. Crop the tilt distance restrictor according to the drawing.



2. Lift the preassembled spring clip [1] with a slotted screwdriver and remove it.
Insert the tilt distance restrictor [2].



8.5.1.3 Scissor stay guide 500, 735



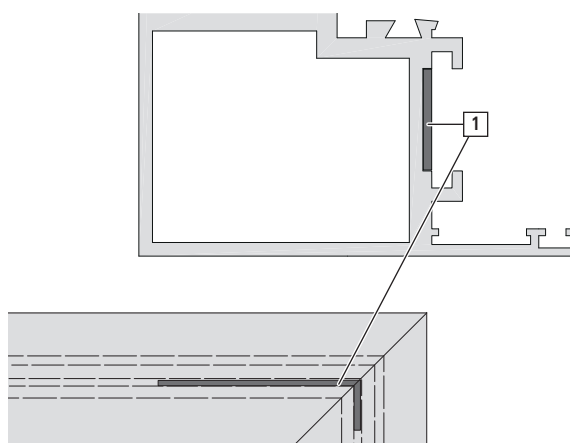
INFO

The installation of scissor stay guide 735 is shown here

Installing scissor stay guide 500, 735

⇒ Connecting rods CR3 and CR4 prepared (see installation drawing → 9 "Installation drawings" from page 248).

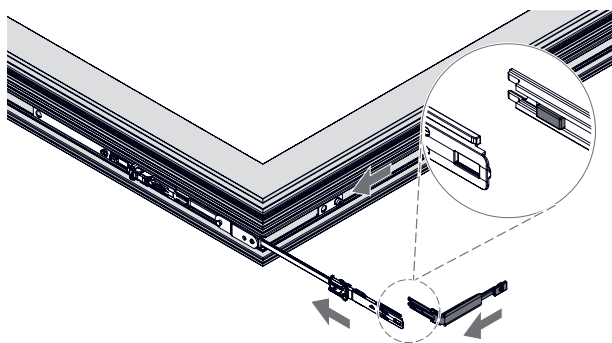
1. For a profile with extended connecting rod groove (ECC), use a profile-related bracket [1] as a support.



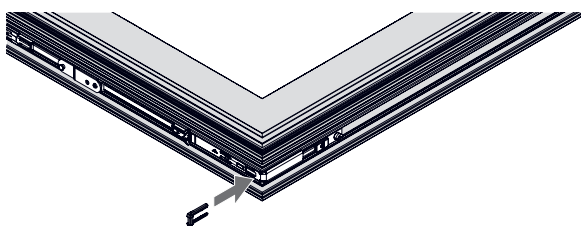


2. Insert connecting rod CR4 with components in the Euro-groove on the hinge side.

Link connecting rod CR3 and the CL corner drive to the scissor stay guide and insert the entire assembly at the top, starting from the hinge side.
Link connecting rod CR4 to the CL corner drive.



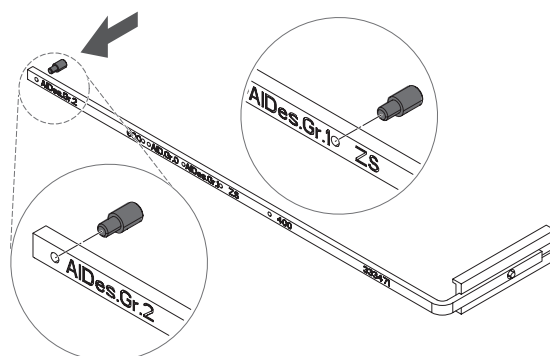
3. Secure the CL corner drive with the retaining fork.



4. Prepare the jig for the scissor stay guide by inserting the positioning pin into the corresponding drill hole (depending on the scissor stay guide selected).

Scissor stay guide 500 = AIDes. size 1

Scissor stay guide 735 = AIDes. size 2



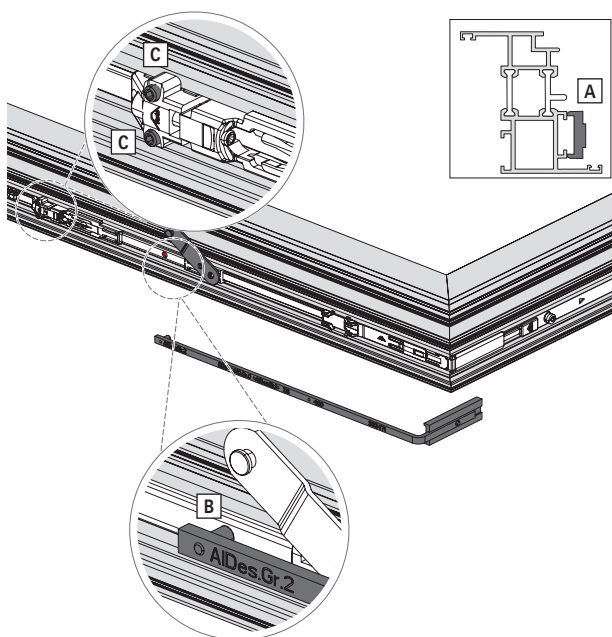
5. Position the jig on the Euro-groove so that it is level [A].

Open the scissor stay guide link and insert the jig positioning pin into the drill hole provided [B].

Secure the scissor stay guide in position with two piercing screws [C].

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm



Installation

Tilt&Turn / TiltFirst / Tilt-Only hardware, handle at the side

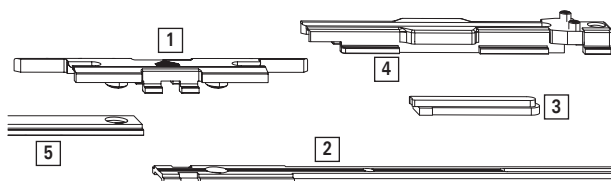
Sash

8.5.1.4 Additional stay arm | 150 kg

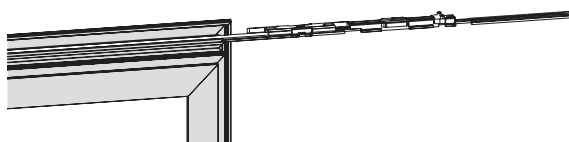
Installing the additional stay arm

1. Connect the scissor stay deadbolt [1] to the coupling rod [2].

Insert the stop [3] into the scissor stay guide [4] as shown and place both on the coupling rod.



2. Connect the additional stay arm sash components to the connecting rod [5] and insert into the sash profile at the top, starting from the locking side.



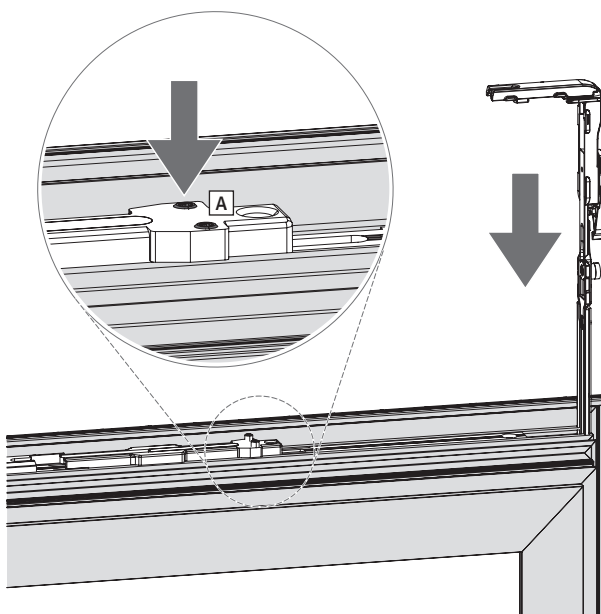
3. Connect the corner drive to the connecting rod and insert it from above into the sash groove on the locking side.

Join with the coupling rod.

4. Fasten the scissor stay guide at the specified position (see installation drawing → 9 "Installation drawings" from page 248) with two preassembled threaded pins [A].

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm



8.5.1.5 Additional stay arm | 180 kg

Installing the additional stay arm

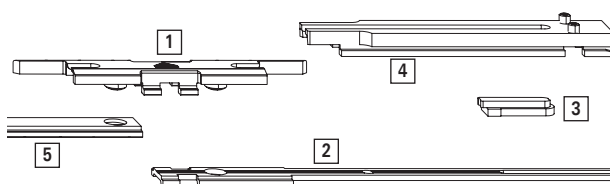
1. Connect the scissor stay deadbolt [1] to the coupling rod [2].

Insert the stop [3] into the scissor stay guide [4] as shown.

For a tilt depth of 160 mm: use a 59 mm stop.

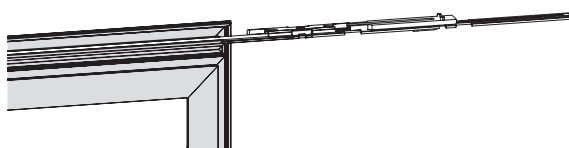
For a tilt depth of 190 mm: use a 34 mm stop.

Position the scissor stay guide on the coupling rod.





2. Connect the additional stay arm sash components to the connecting rod [5] and insert into the sash profile at the top, starting from the locking side.

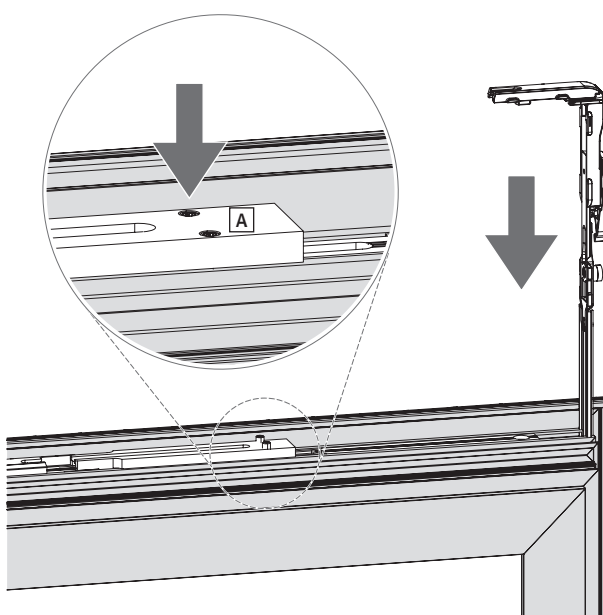


3. Connect the corner drive to the connecting rod and insert it into the sash groove from above on the locking side.
Join with the coupling rod.

4. Fasten the scissor stay guide at the specified position (see installation drawing → 9 "Installation drawings" from page 248) with two preassembled threaded pins [A].

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm



8.5.1.6 Corner hinge

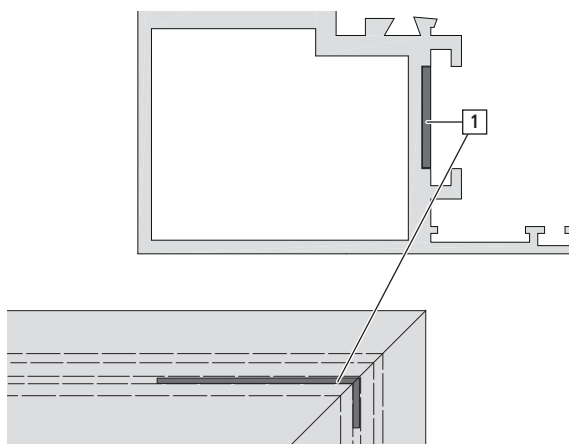


INFO

The 180 kg adjustment piece does not feature lateral adjustment.

Installing the corner hinge

1. For a profile with extended connecting rod groove (ECC), use a profile-related bracket [1] as a support.



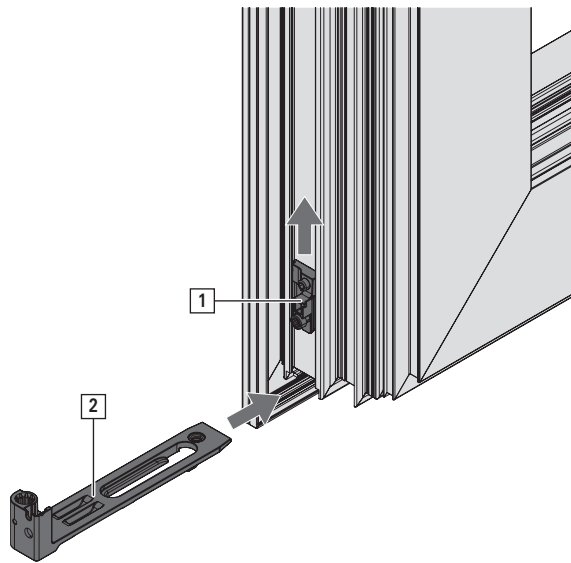
Installation

Tilt&Turn / TiltFirst / Tilt-Only hardware, handle at the side

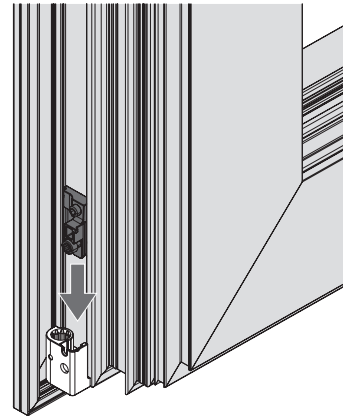
Sash

2. Insert the adjustment piece [1] into the connecting rod groove on the hinge side.

Insert the corner hinge [2] into the connecting rod groove at the bottom.



3. Push the adjustment piece into the corner hinge.

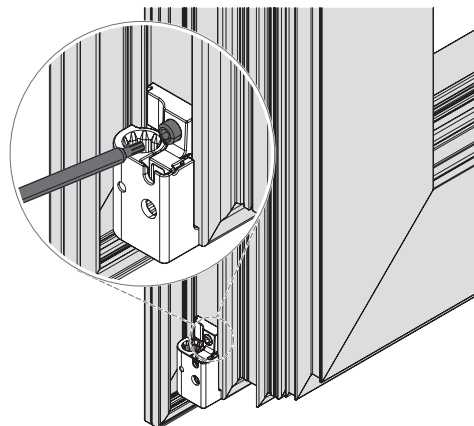


4. Secure the adjustment piece with a preassembled threaded pin.

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm

Check that the hinge is fitted securely.



8.5.1.7 Locking sleeve



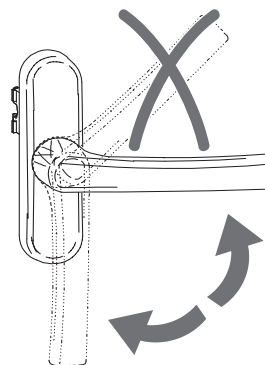
INFO

TiSs: only screw down the locking sleeve with the screw after the sash stay has been mounted.



Installing the locking sleeve

1. Produce the espagnolette lock by using a locking sleeve in the slot on connecting rod CR2.

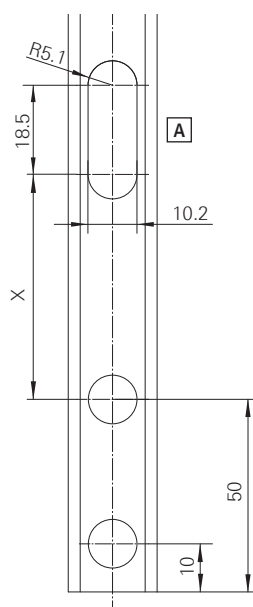


2. Produce the slot in connecting rod CR2 before installation [A].



INFO

X = freely positionable (suggestion: 60 mm)



3. Drill out the sash in the 90° handle position [B] for locking sleeve with screw [C].

Drill the hole:

1 x Ø 3.5 mm; at least 4 mm deep.

Fasten the locking sleeve [1] with the screw [2].

Tool: T25 hexalobular socket screwdriver

Torque: 1.5 – 2.0 Nm



8.5.2 Frame



INFO

Install the frame components when the frame is horizontal (workshop).

Once the frame is fitted, the reveal may prevent frame components from being installed correctly.

8.5.2.1 Pivot rest

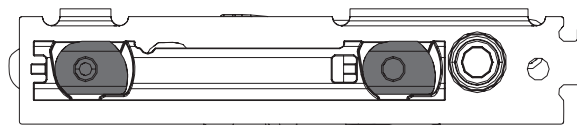
Installing the pivot rest

1. Align the clamping blocks.

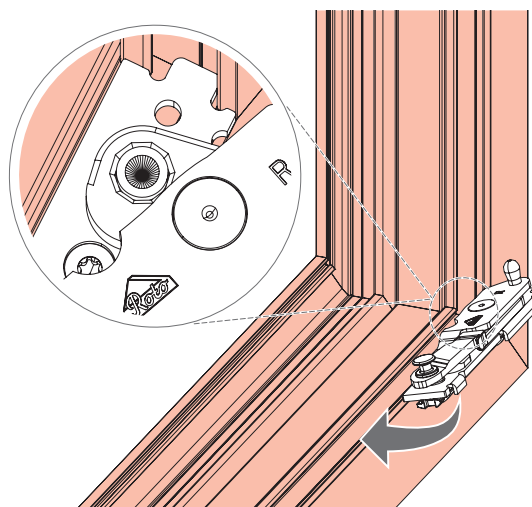


INFO

For selecting the clamp strip version depending on the clamp strip dimensions = C (profile leg thickness) + J (groove inside width), → *from page 37*.



2. Open the bearing and swing it into the profile so that the baseplate engages behind it.



3. Push the baseplate onto the profile so that it is level and tighten the preassembled screw [1].

Check that the bearing is fitted securely.

Tighten the screw [2].

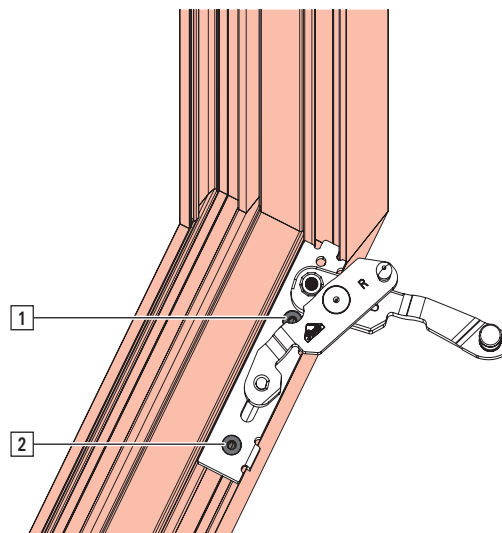
Tool: T20 hexalobular socket screwdriver

Torque: 4.5 – 5.5 Nm



INFO

- Depending on the strength of the profile, or with a base groove thickness > 2 mm, it may be necessary to predrill the area of the screw [2]. To do so, use the pivot rest / stay bearing jig or create the corresponding drilling pattern in mechanical production (→ *from page 35*).
- Note the screw sequence [1], [2].
- Install and remove the bearing a maximum of two times.



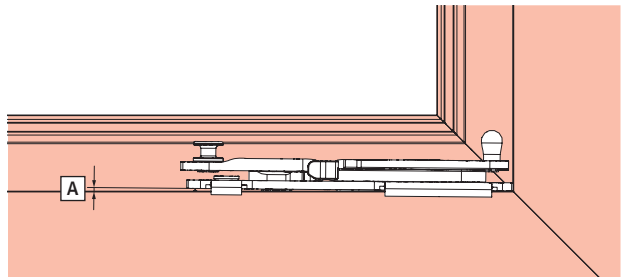


4. Close the bearing.



INFO

Do not leave a gap between the baseplate and profile [A].



8.5.2.2 Sash stay 500, 735

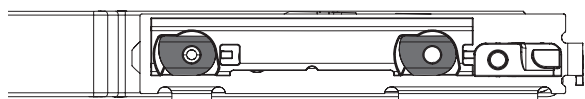
Installing sash stay 500, 735

1. Align the clamping blocks.

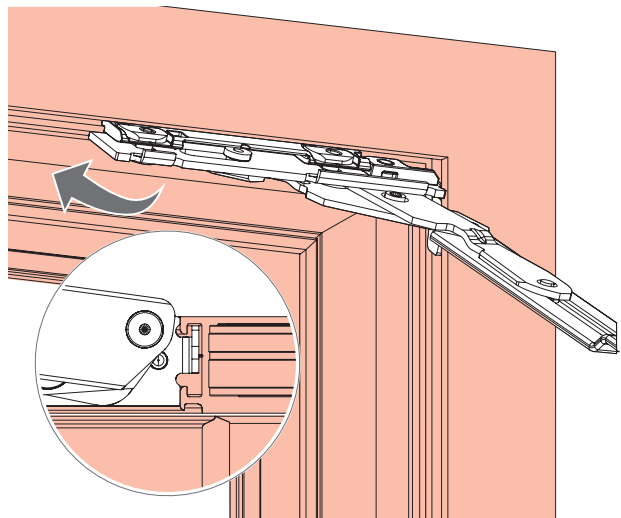


INFO

For selecting the clamp strip version depending on the clamp strip dimensions = C (profile leg thickness) + J (groove inside width), → *from page 37*.



2. Open the sash stay and swing the bearing into the profile so that the baseplate engages behind it.



Installation

Tilt&Turn / TiltFirst / Tilt-Only hardware, handle at the side

Frame

3. Push the baseplate onto the profile so that it is level and tighten the preassembled screw [1].

Check that the sash stay is fitted securely.

Tighten the screw [2].

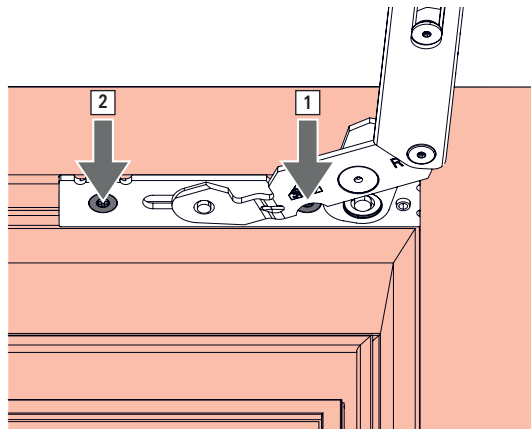
Tool: T20 hexalobular socket screwdriver

Torque: 4.5 – 5.5 Nm



INFO

- Depending on the strength of the profile, or with a base groove thickness > 2 mm, it may be necessary to predrill the area of the screw [2]. To do so, use the pivot rest / stay bearing jig or create the corresponding drilling pattern in mechanical production (→ *from page 35*).
- Note the screw sequence [1], [2].
- Install and remove the sash stay a maximum of two times.

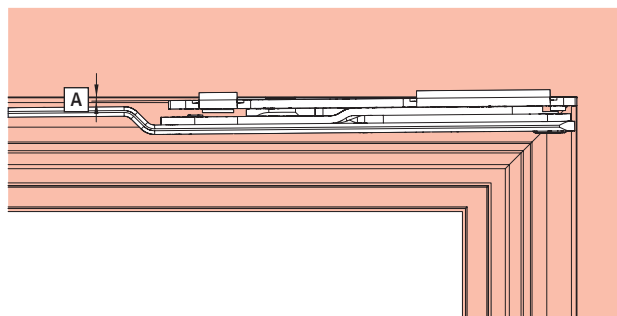


4. Close the sash stay.



INFO

Do not leave a gap between the baseplate and profile [A].



8.5.2.3 Clamp strip on sash stay 390

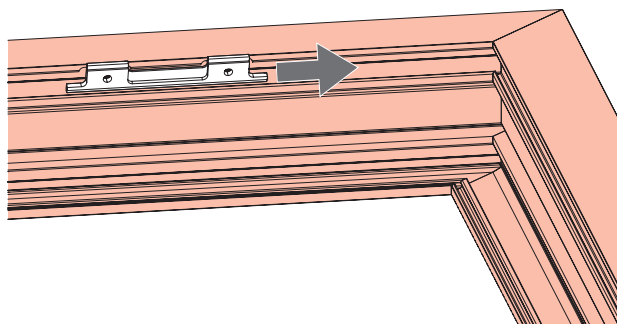
Installing the clamp strip on sash stay 390

1. Swing the clamp strip into the routing → *from page 182*. Prevent the clamp strip from falling out due to movement.



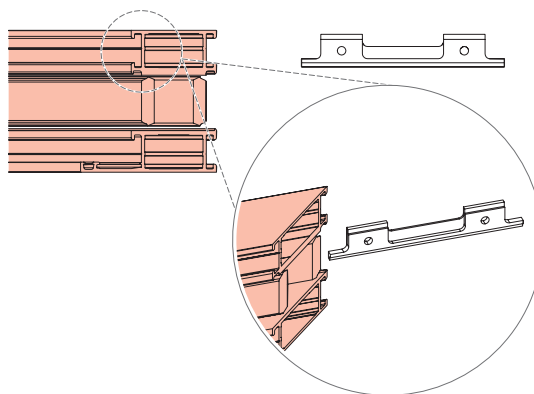
INFO

Ensure that the clamp strip is correctly aligned in the frame profile.





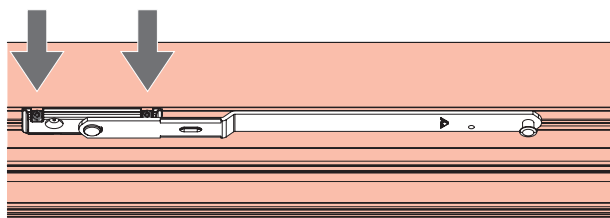
- Alternatively: insert the clamp strip into the profile on the separate rod.



8.5.2.4 Additional stay arm frame components

Installing the additional stay arm

- Swing the additional scissor stay arm, compl., into the frame at the specified position (see installation drawing → 9 "Installation drawings" from page 248).



- Fasten the bearing with two preassembled threaded pins.

Tool: T10 hexalobular socket screwdriver

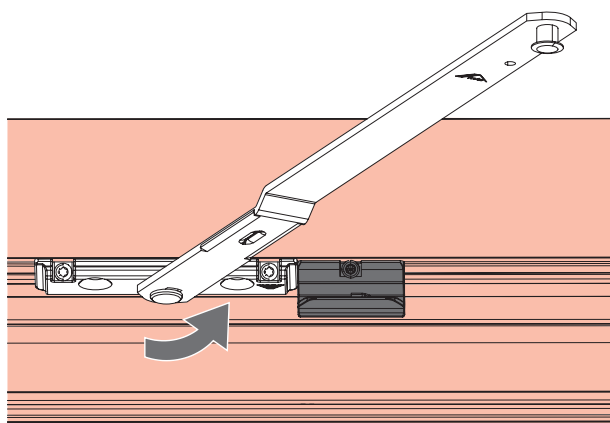
Torque: 2 – 2.5 Nm

- Open the additional scissor stay arm and position the retaining spring next to the bearing.

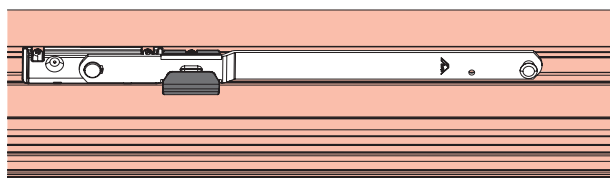
Fasten the retaining spring with a preassembled threaded pin.

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm



- Clip the additional scissor stay arm into the retaining spring.



8.5.3 Joining the sash and frame

**CAUTION****Heavy loads pose the risk of injury and property damage.**

Lifting and carrying heavy loads in an uncontrolled manner may lead to physical injury and property damage.

- ▶ Transport and installation must be carried out by at least two people.
- ▶ Use transportation means. → 14 "Transport" from page 319

8.5.3.1 Connecting the sash to the pivot rest

**WARNING****Potential risk of death caused by an unsecured sash!**

The sash may fall during installation if it is not securely connected to the frame.

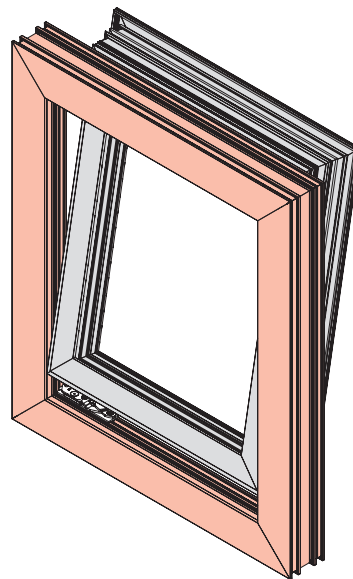
- ▶ Secure the sash to prevent it from falling, e.g. by using two people.

⇒ Pivot rest and sash stay closed

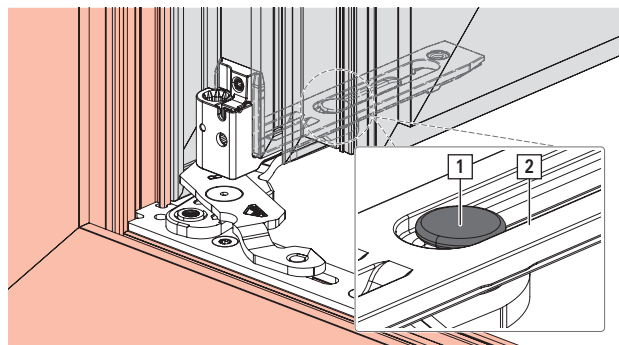
1. Move the handle to the turn position.
2. With the sash slightly tilted inwards, guide it along the frame in a downwards direction until you feel the hinge engage in the bearing.

**INFO**

When hinging the sash, ensure that the overlap gasket is not moved.



3. Check that the slider bolt [1] is fully engaged in the corner hinge [2].





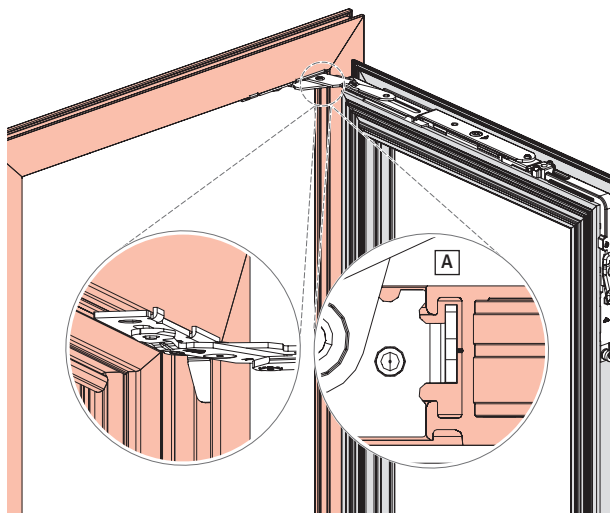
8.5.3.2 Mounting sash stay 390

1. Open the sash approx. 90°.
Open the stay bearing approx. 90° and swing it in-
to the frame.

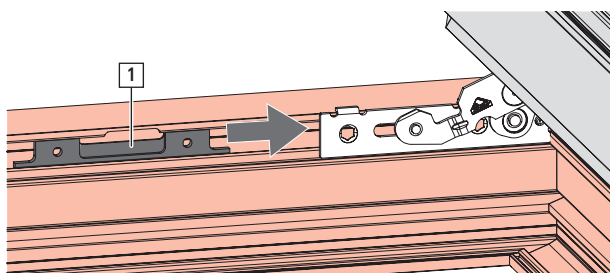


INFO

The baseplate must engage behind it [A].



2. Move the clamp strip [1] as far as it will go.

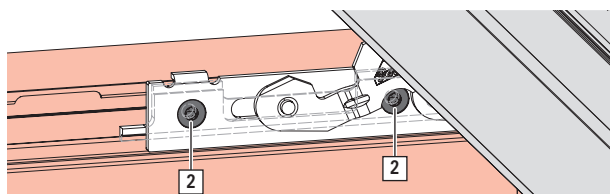


3. Push the baseplate onto the profile so that it is level and fasten the clamp strip with two supplied screws [2].

Tool: T20 hexalobular socket screwdriver

Torque: 4.5 – 5.5 Nm

Check that the sash stay is fitted securely.

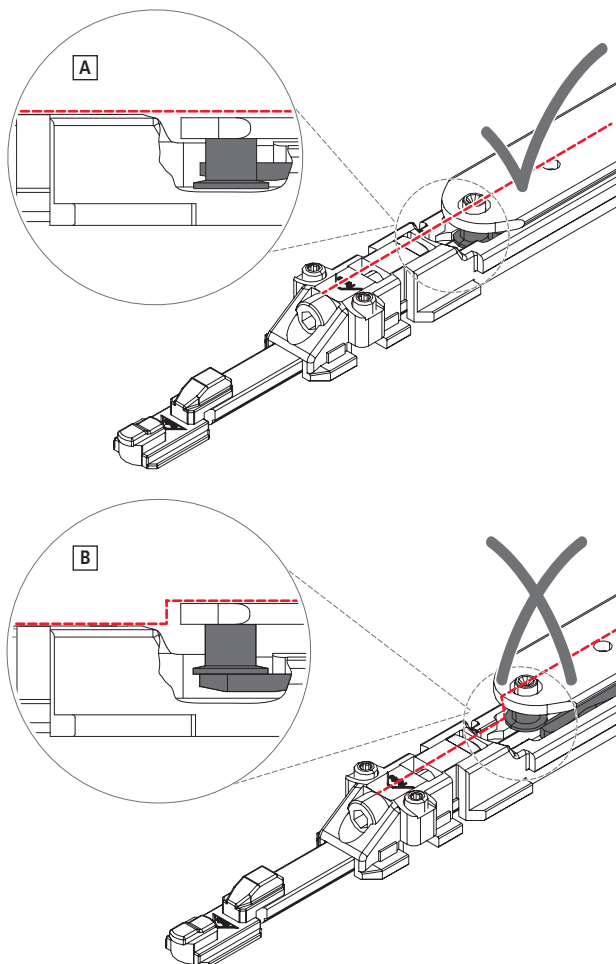


8.5.3.3 Mounting sash stay 500

**WARNING****Potential risk of death caused by an unsecured sash!**

The sash may fall if the sash stay is not correctly connected to the scissor stay guide.

- Check correct mounting. The lower edge of the stay arm must be below the top edge of the scissor stay guide [A] and must not protrude beyond the housing of the scissor stay guide [B].



⇒ Connect the sash to the pivot rest → *from page 204*.

1. Open the sash slightly (by approx. 10°).
2. Push down on the mishandling device on the corner drive or flush-encased gearbox.
Move the handle to the tilt position.

Under normal circumstances, this constitutes incorrect operation of the hardware, but it is a necessary step in this case.

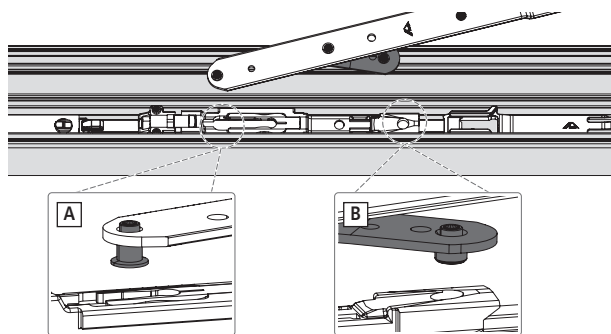


3. With the sash slightly tilted, hold it in position.
Mount the sash stay in the scissor stay guide, ensuring that you use the following mounting points:

- [A] Mounting bolt on the stay arm in the guide groove of the scissor stay guide
- [B] Bolt on the stay arm link in the scissor stay guide recess

Push down on the mishandling device again to return the handle to the turn position.

Check that the sash runs smoothly by fully opening and closing it in all positions.



8.5.3.4 Mounting sash stay 735

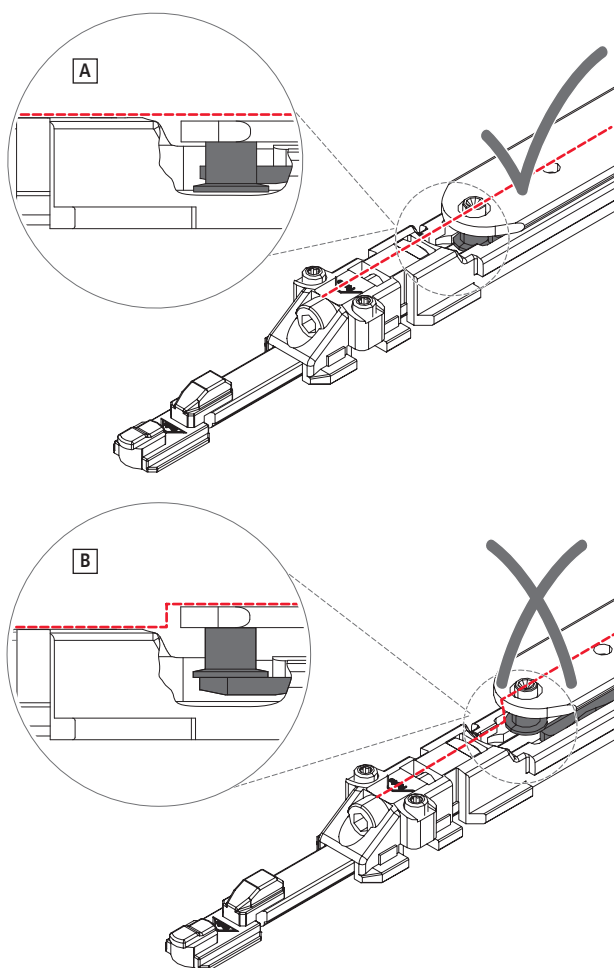


WARNING

Potential risk of death caused by an unsecured sash!

The sash may fall if the sash stay is not correctly connected to the scissor stay guide and if the retaining spring is not correctly engaged in the sash stay.

- Check correct mounting. The top edge of the stay arm must be level with the top edge of the scissor stay guide [A] and must not protrude beyond the housing of the scissor stay guide [B].



- Check that the retaining spring is seated correctly. The retaining spring must not be bent and must rest flat on the stay arm.

⇒ Connect the sash to the pivot rest → *from page 204.*

1. Open the sash slightly (by approx. 10°).
2. Push down on the mishandling device on the corner drive or flush-encased gearbox.
 Move the handle to the tilt position.

Under normal circumstances, this constitutes incorrect operation of the hardware, but it is a necessary step in this case.

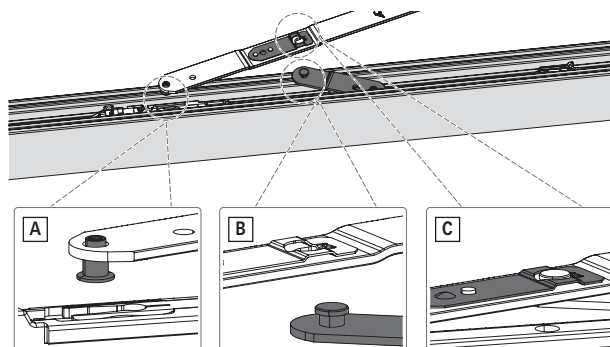
3. With the sash slightly tilted, hold it in position.
 Mount the sash stay in the scissor stay guide, ensuring that you use the following mounting points:

- [A] Mounting bolt on the stay arm in the guide groove of the scissor stay guide
- [B] Bolt on the scissor stay guide in the opening on the stay arm

Check that the retaining spring is seated correctly. The retaining spring must not be bent and must rest flat on the stay arm [C].

Push down on the mishandling device again to return the handle to the turn position.

Check that the sash runs smoothly by fully opening and closing it in all positions.



8.6 Turn-Only hardware

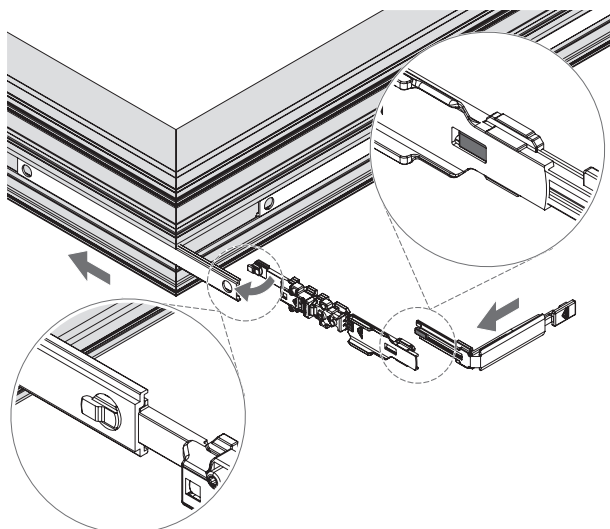
8.6.1 Sash

8.6.1.1 Rebate stay hinge, couplable

Installing the rebate stay hinge, couplable

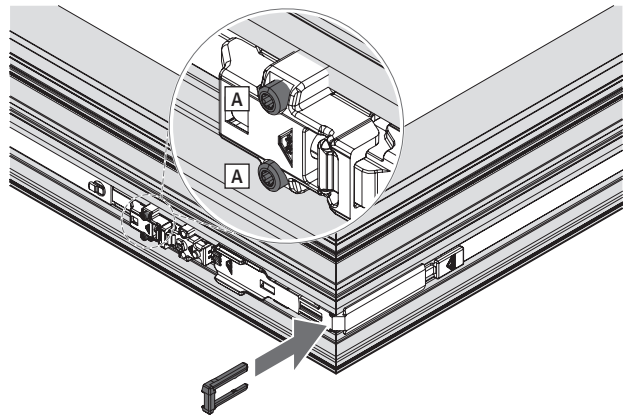
⇒ Connecting rods CR3 and CR4 prepared (see installation drawing → 9 "Installation drawings" from page 248).

1. Insert connecting rod CR4 with components in the Euro-groove on the hinge side.
 Link connecting rod CR3 and the CL corner drive to the rebate stay hinge and insert the entire assembly at the top, starting from the hinge side.
 Link connecting rod CR4 to the CL corner drive.





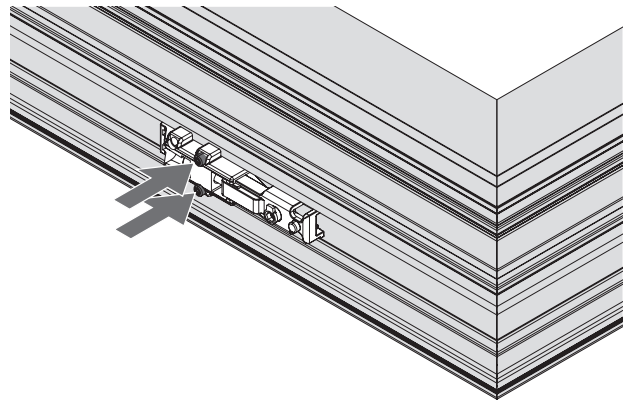
- Secure the CL corner drive with the retaining fork.
 Fix the rebate stay hinge in position with two piercing screws [A].
 Tool: T10 hexalobular socket screwdriver
 Torque: 2 – 2.5 Nm



8.6.1.2 Rebate stay hinge

Installing the rebate stay hinge

- Insert the rebate stay hinge into the Euro-groove at the top.
 Fix the rebate stay hinge in position (see installation drawing → 9 "Installation drawings" from page 248) with two piercing screws [A].
 Tool: T10 hexalobular socket screwdriver
 Torque: 2 – 2.5 Nm



8.6.1.3 Scissor stay guide 500, 735



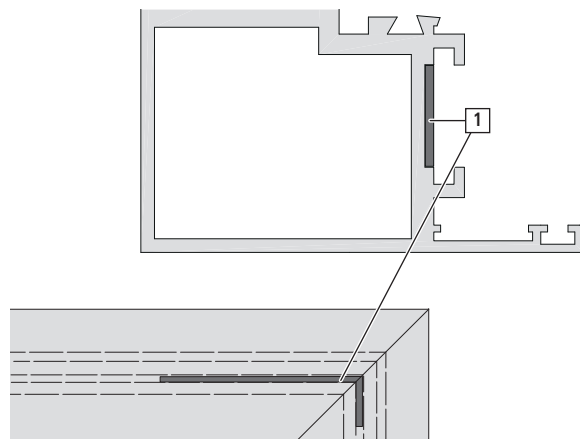
INFO

The installation of scissor stay guide 735 is shown here

Installing scissor stay guide 500, 735

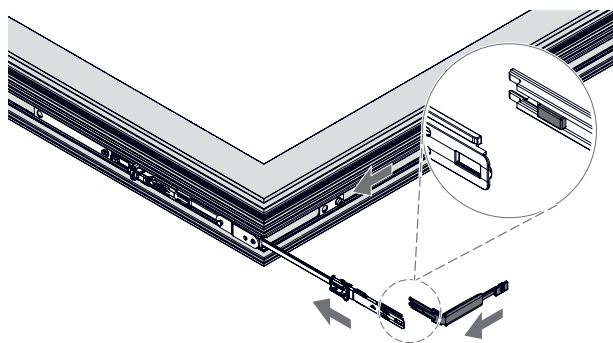
⇒ Connecting rods CR3 and CR4 prepared (see installation drawing → 9 "Installation drawings" from page 248).

- For a profile with extended connecting rod groove (ECC), use a profile-related bracket [1] as a support.

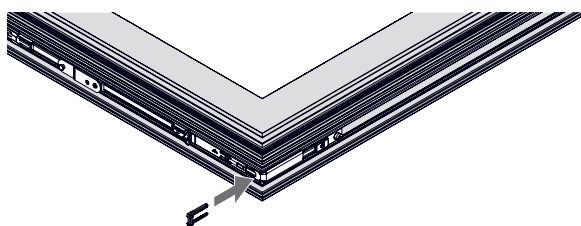


2. Insert connecting rod CR4 with components in the Euro-groove on the hinge side.

Link connecting rod CR3 and the CL corner drive to the scissor stay guide and insert the entire assembly at the top, starting from the hinge side.
 Link connecting rod CR4 to the CL corner drive.



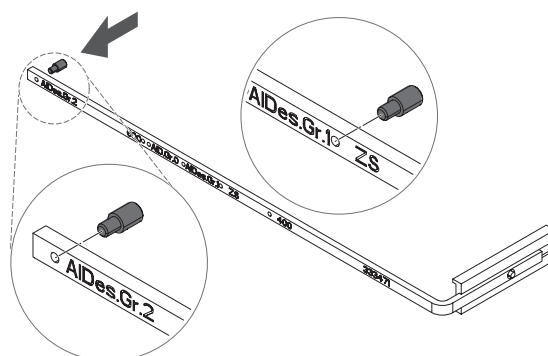
3. Secure the CL corner drive with the retaining fork.



4. Prepare the jig for the scissor stay guide by inserting the positioning pin into the corresponding drill hole (depending on the scissor stay guide selected).

Scissor stay guide 500 = AIDes. size 1

Scissor stay guide 735 = AIDes. size 2



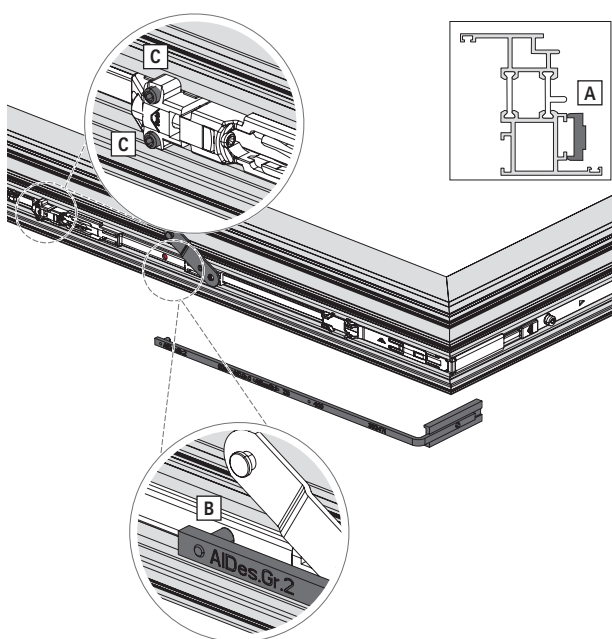
5. Position the jig on the Euro-groove so that it is level [A].

Open the scissor stay guide link and insert the jig positioning pin into the drill hole provided [B].

Secure the scissor stay guide in position with two piercing screws [C].

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm





8.6.1.4 Corner hinge

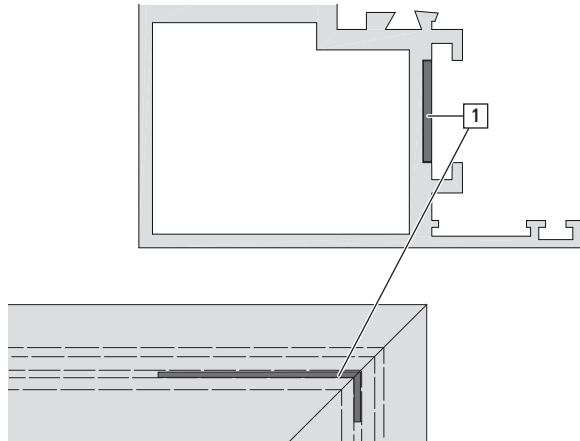


INFO

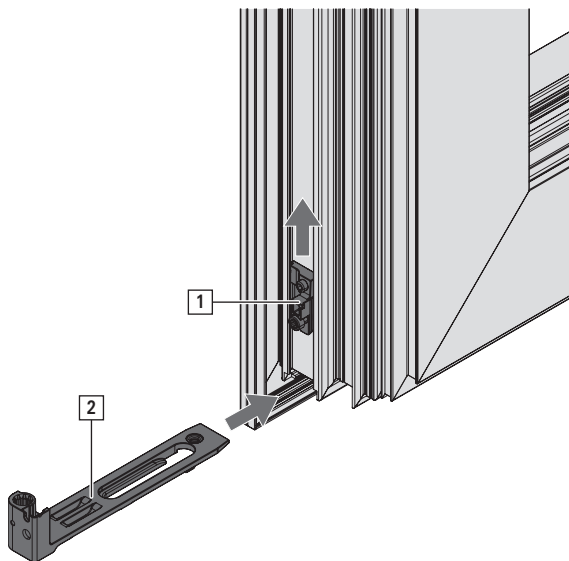
The 180 kg adjustment piece does not feature lateral adjustment.

Installing the corner hinge

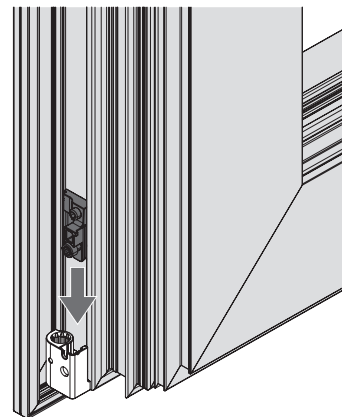
1. For a profile with extended connecting rod groove (ECC), use a profile-related bracket [1] as a support.



2. Insert the adjustment piece [1] into the connecting rod groove on the hinge side.
Insert the corner hinge [2] into the connecting rod groove at the bottom.



3. Push the adjustment piece into the corner hinge.

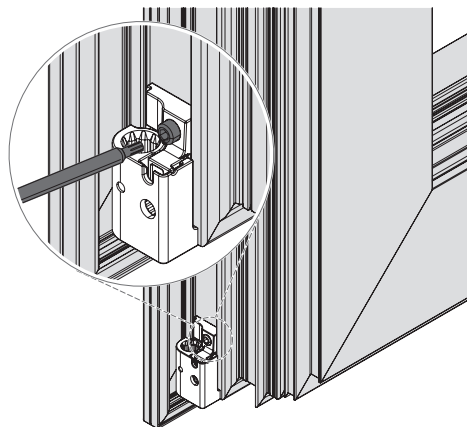


4. Secure the adjustment piece with a preassembled threaded pin.

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm

Check that the hinge is fitted securely.



8.6.1.5 CL sash component

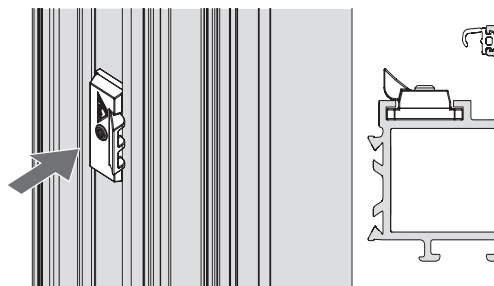
Installing the CL sash component

1. Insert the CL sash component into the sash groove on the hinge side.

Fasten the CL sash component at the specified position (see installation drawing → 9 "Installation drawings" from page 248) with a preassembled threaded pin.

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm



8.6.1.6 Locking sleeve

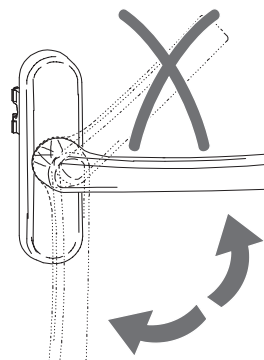


INFO

Sash stay 735: only screw down the locking sleeve with the screw after the sash stay has been mounted.

Installing the locking sleeve

1. Produce the espagnolette lock by using a locking sleeve in the slot on connecting rod CR2.



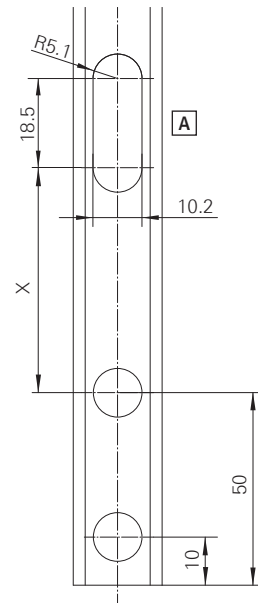


2. Produce the slot in connecting rod CR2 before installation [A].



INFO

X = freely positionable (suggestion: 60 mm)



3. Drill out the sash in the 90° handle position [B] for locking sleeve with screw [C].

Drill the hole:

1 x Ø 3.5 mm; at least 4 mm deep.

Fasten the locking sleeve [1] with the screw [2].

Tool: T25 hexalobular socket screwdriver

Torque: 1.5 – 2.0 Nm



8.6.2 Frame



INFO

Install the frame components when the frame is horizontal (workshop).

Once the frame is fitted, the reveal may prevent frame components from being installed correctly.

8.6.2.1 Pivot rest

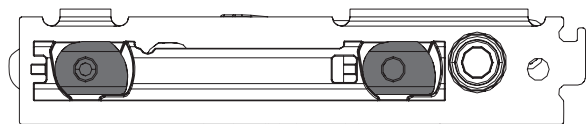
Installing the pivot rest

1. Align the clamping blocks.

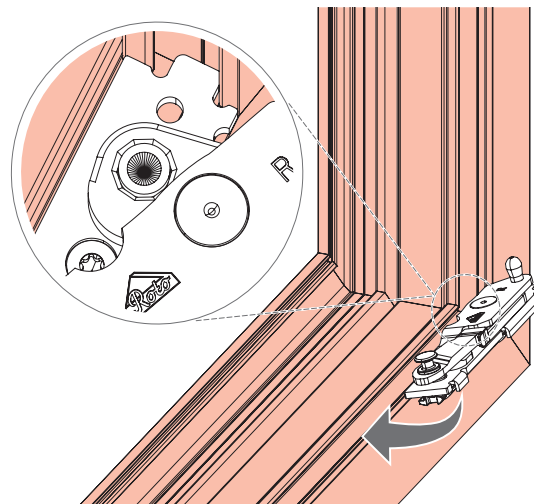


INFO

For selecting the clamp strip version depending on the clamp strip dimensions = C (profile leg thickness) + J (groove inside width), → *from page 37*.



2. Open the bearing and swing it into the profile so that the baseplate engages behind it.

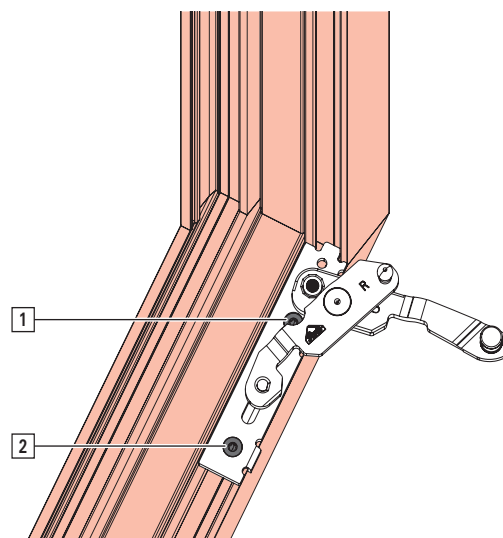


3. Push the baseplate onto the profile so that it is level and tighten the preassembled screw [1].
 Check that the bearing is fitted securely.
 Tighten the screw [2].
 Tool: T20 hexalobular socket screwdriver
 Torque: 4.5 – 5.5 Nm



INFO

- Depending on the strength of the profile, or with a base groove thickness > 2 mm, it may be necessary to predrill the area of the screw [2]. To do so, use the pivot rest / stay bearing jig or create the corresponding drilling pattern in mechanical production (→ *from page 35*).
- Note the screw sequence [1], [2].
- Install and remove the bearing a maximum of two times.

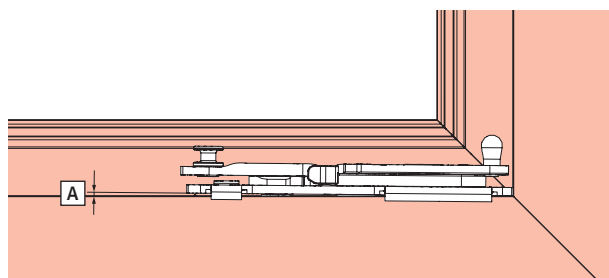


4. Close the bearing.



INFO

Do not leave a gap between the baseplate and profile [A].



8.6.2.2 Rebate sash stay / rebate sash stay, couplable / sash stay 735



INFO

The installation of sash stay 735 is shown here



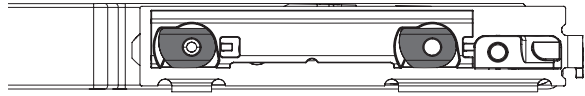
Installing the rebate sash stay / rebate sash stay, couplable / sash stay 735

1. Align the clamping blocks.

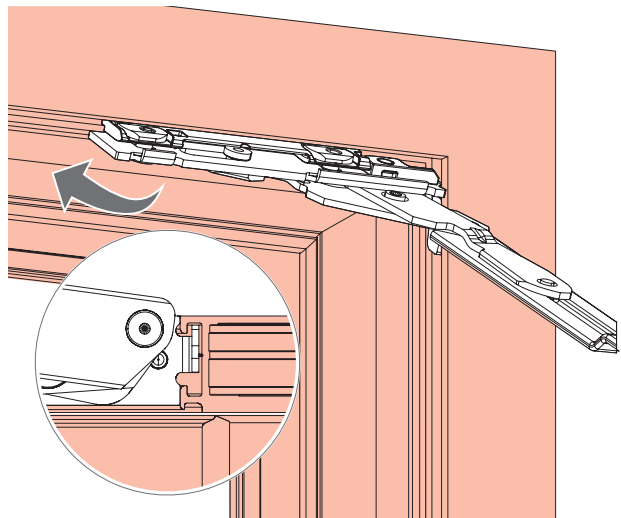


INFO

For selecting the clamp strip version depending on the clamp strip dimensions = C (profile leg thickness) + J (groove inside width), → *from page 37*.



2. Open the sash stay and swing the bearing into the profile so that the baseplate engages behind it.



3. Push the baseplate onto the profile so that it is level and tighten the preassembled screw [1].
 Check that the sash stay is fitted securely.
 Tighten the screw [2].

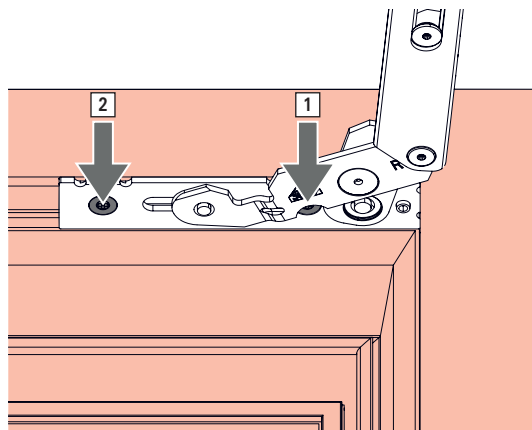
Tool: T20 hexalobular socket screwdriver

Torque: 4.5 – 5.5 Nm



INFO

- Depending on the strength of the profile, or with a base groove thickness > 2 mm, it may be necessary to predrill the area of the screw [2]. To do so, use the pivot rest / stay bearing jig or create the corresponding drilling pattern in mechanical production (→ *from page 35*).
- Note the screw sequence [1], [2].
- Install and remove the sash stay a maximum of two times.

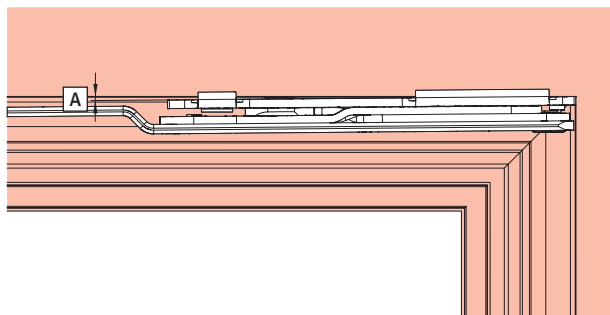


4. Close the sash stay.



INFO

Do not leave a gap between the base-plate and profile [A].



8.6.2.3 CL frame component

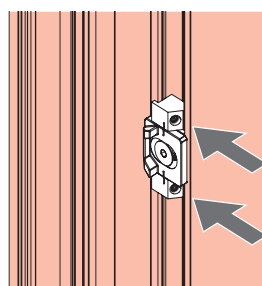
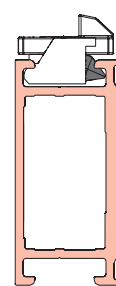
Installing the CL frame component

1. Move the CL frame component on the hinge side into the frame at the specified position (see installation drawing → 9 "Installation drawings" from page 248).

Fasten the CL frame component with two preassembled threaded pins.

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm



2. After the sash is joined to the frame, adjust the gasket compression → from page 304.



INFO

If the frame component is not adjusted, the profile may be warped.



8.6.3 Joining the sash and frame



CAUTION

Heavy loads pose the risk of injury and property damage.

Lifting and carrying heavy loads in an uncontrolled manner may lead to physical injury and property damage.

- Transport and installation must be carried out by at least two people.
- Use transportation means. → 14 "Transport" from page 319

8.6.3.1 Connecting the sash to the pivot rest



WARNING

Potential risk of death caused by an unsecured sash!

The sash may fall during installation if it is not securely connected to the frame.

- Secure the sash to prevent it from falling, e.g. by using two people.

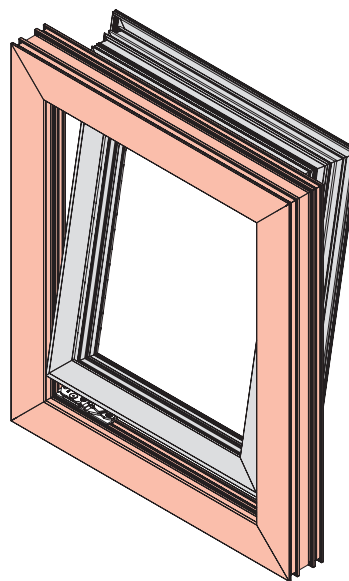
⇒ Pivot rest and sash stay closed

1. Move the handle to the turn position.
2. With the sash slightly tilted inwards, guide it along the frame in a downwards direction until you feel the hinge engage in the bearing.

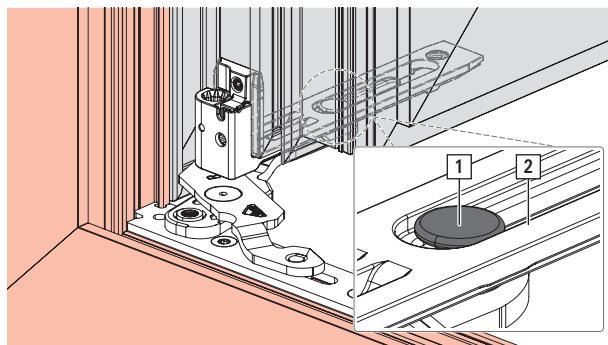


INFO

When hinging the sash, ensure that the overlap gasket is not moved.



3. Check that the slider bolt [1] is fully engaged in the corner hinge [2].



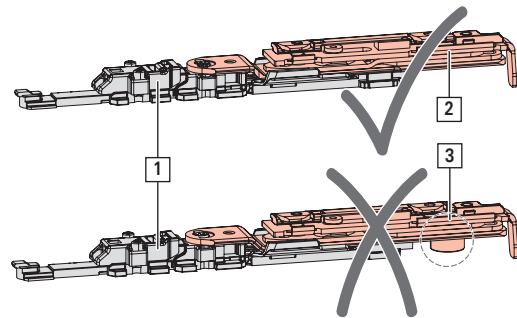
8.6.3.2 Mounting the rebate sash stay, couplable

**WARNING**

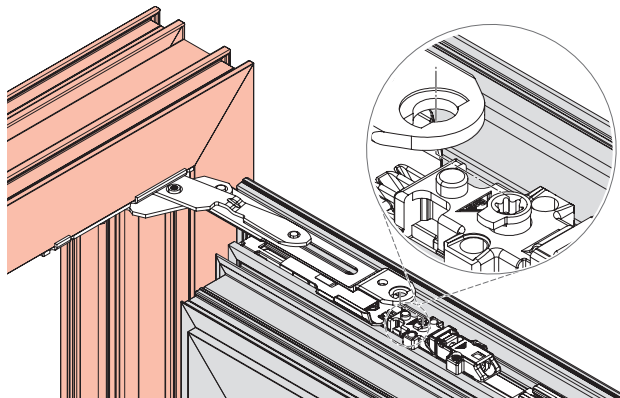
Incorrect installation may pose a risk of death!

The combination of "rebate stay hinge, couplable [1]" installed with "rebate sash stay with clamp strip [3]" can lead to hazardous situations or even cause the sash to fall.

- Only install the "rebate stay hinge, couplable [1]" in conjunction with the "rebate sash stay, couplable, with clamp strip [2]".



1. Connect the pivot rest to the corner hinge → *from page 204*.
2. Open the rebate sash stay, couplable, and guide it on the sash via the rebate stay hinge, couplable.
Guide the swivel pin on the rebate stay hinge, couplable, through the drill hole on the rebate sash stay, couplable.



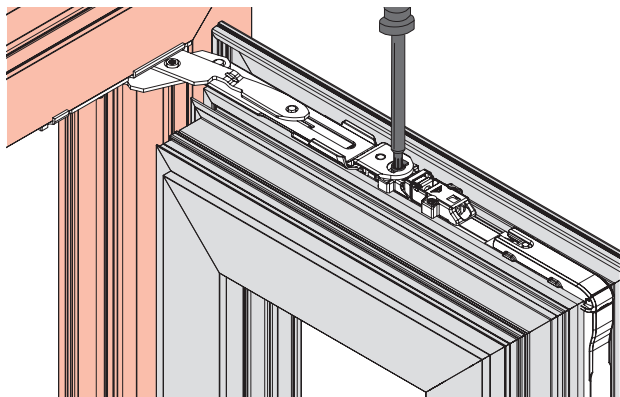
3. Lock the connection by turning the pin 180°.
Tool: T25 hexalobular socket screwdriver

**WARNING**

Incorrect installation may pose a risk of death!

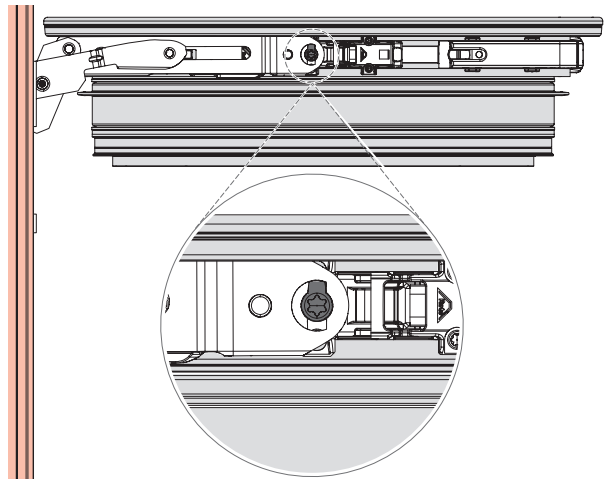
A missing connection can lead to hazardous situations or even cause the sash to fall.

- Lock by turning the pin 180°.





4. View from above, after locking.



8.6.3.3 Mounting the rebate sash stay

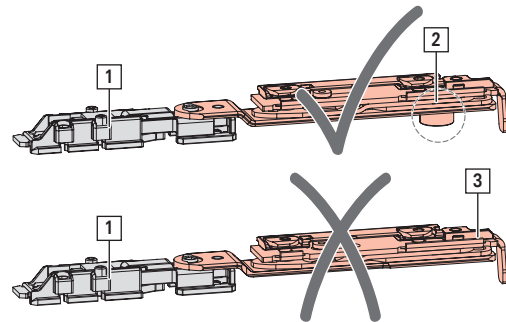


WARNING

Incorrect installation may pose a risk of death!

The combination of "rebate stay hinge [1]" installed with "rebate sash stay, couplable, with clamp strip [3]" can lead to hazardous situations or even cause the sash to fall.

- ▶ Only install the "rebate stay hinge [1]" in conjunction with the "rebate sash stay with clamp strip [2]".



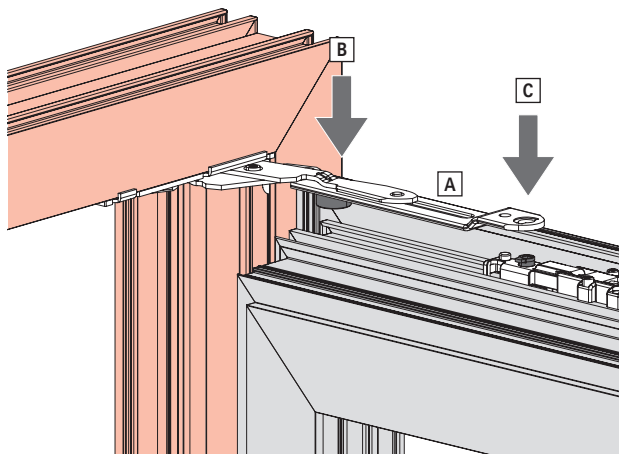
WARNING

An unsecured sash may pose a risk of death!

A missing connection can lead to hazardous situations or even cause the sash to fall.

- ▶ Check correct mounting.
- ▶ Lock by turning the cam 180°.

1. Connect the pivot rest to the corner hinge → *from page 204*.
2. Open the rebate sash stay and guide it on the sash via the rebate stay hinge [A].
Insert the eccentric cam into the sash groove [B].
Guide the swivel cam on the rebate stay hinge through the drill hole in the rebate sash stay [C].



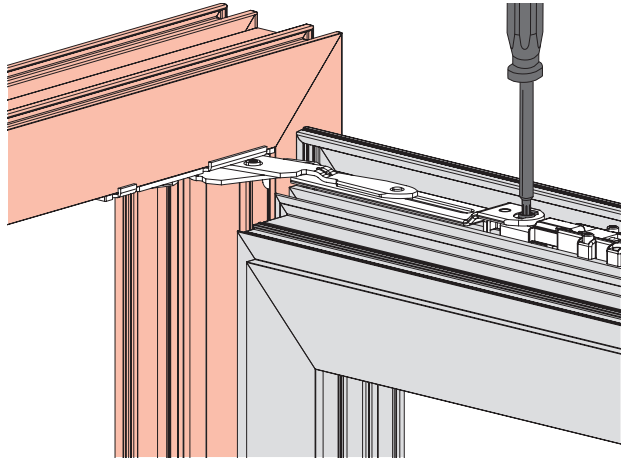
Installation

Turn-Only hardware

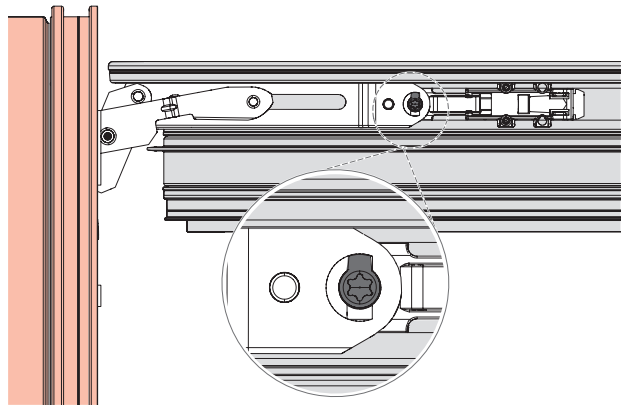
Joining the sash and frame

3. Lock the connection by turning the cam 180°.

Tool: T25 hexalobular socket screwdriver



4. View from above, after locking.





8.6.3.4 Mounting sash stay 735

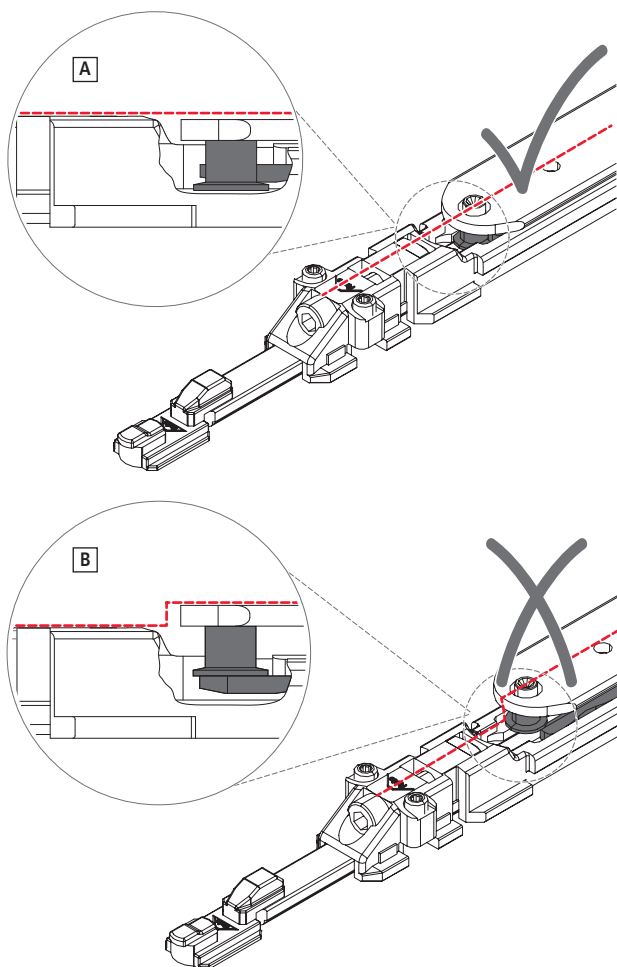


WARNING

Potential risk of death caused by an unsecured sash!

The sash may fall if the sash stay is not correctly connected to the scissor stay guide and if the retaining spring is not correctly engaged in the sash stay.

- Check correct mounting. The top edge of the stay arm must be level with the top edge of the scissor stay guide [A] and must not protrude beyond the housing of the scissor stay guide [B].



- Check that the retaining spring is seated correctly. The retaining spring must not be bent and must rest flat on the stay arm.

⇒ Connect the sash to the pivot rest → *from page 204.*

1. Open the sash slightly (by approx. 10°).
2. Push down on the mishandling device on the corner drive or flush-encased gearbox.
Move the handle to the tilt position.

Under normal circumstances, this constitutes incorrect operation of the hardware, but it is a necessary step in this case.

Installation

Tilt-Only hardware, handle at the top

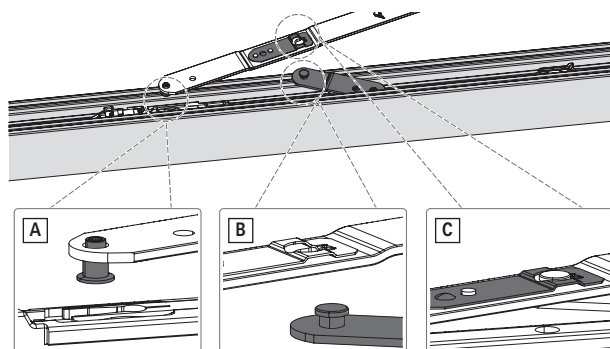
3. With the sash slightly tilted, hold it in position.
Mount the sash stay in the scissor stay guide, ensuring that you use the following mounting points:

- [A] Mounting bolt on the stay arm in the guide groove of the scissor stay guide
- [B] Bolt on the scissor stay guide in the opening on the stay arm

Check that the retaining spring is seated correctly. The retaining spring must not be bent and must rest flat on the stay arm [C].

Push down on the mishandling device again to return the handle to the turn position.

Check that the sash runs smoothly by fully opening and closing it in all positions.



8.7 Tilt-Only hardware, handle at the top

8.7.1 Sash

8.7.1.1 CL sash component

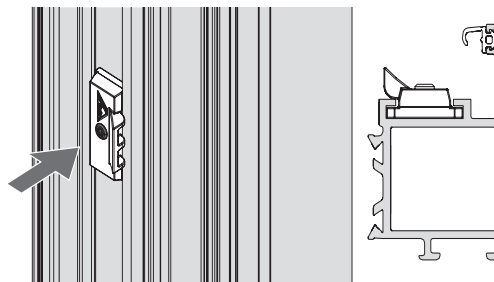
Installing the CL sash component

1. Insert the CL sash component into the sash groove on the hinge side.

Fasten the CL sash component at the specified position (see installation drawing → 9 "Installation drawings" from page 248) with a preassembled threaded pin.

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm





8.7.1.2 Tilt-Only stay arm slide bar

Installing the Tilt-Only stay arm slide bar

1. Insert the Tilt-Only stay arm slide bar into the sash groove.



INFO

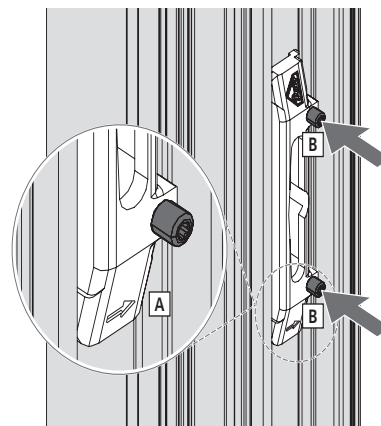
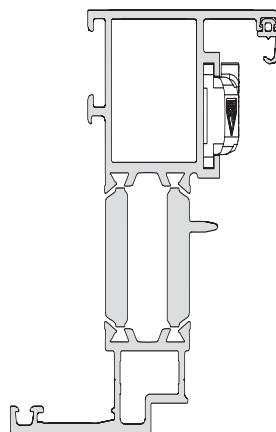
Pay attention to the installation direction of the slide bar. The arrow [A] must point towards the sash overlap.

Screw down the slide bar with two preassembled piercing screws [B].

Check that the slide bar is fitted securely.

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm



8.7.1.3 Rebate stay hinge

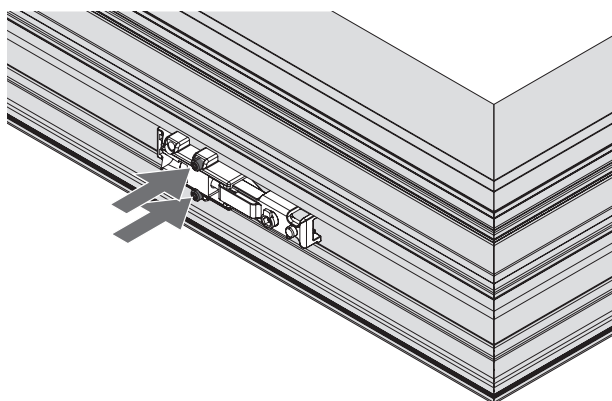
Installing the rebate stay hinge

1. Insert the rebate stay hinge into the Euro-groove at the top.

Fix the rebate stay hinge in position (see installation drawing → 9 "Installation drawings" from page 248) with two piercing screws [A].

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm



Installation

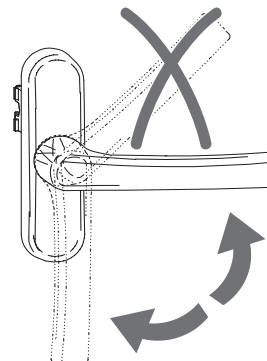
Tilt-Only hardware, handle at the top

Frame

8.7.1.4 Locking sleeve

Installing the locking sleeve

1. Produce the espagnolette lock by using a locking sleeve in the slot on connecting rod CR2.

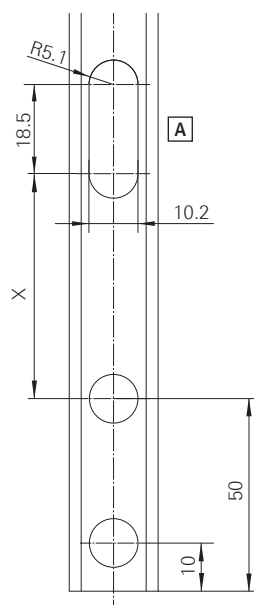


2. Produce the slot in connecting rod CR2 before installation [A].



INFO

X = freely positionable (suggestion: 60 mm)



3. Drill out the sash in the 90° handle position [B] for locking sleeve with screw [C].

Drill the hole:

1 x Ø 3.5 mm; at least 4 mm deep.

Fasten the locking sleeve [1] with the screw [2].

Tool: T25 hexalobular socket screwdriver

Torque: 1.5 – 2.0 Nm



8.7.2 Frame



INFO

Install the frame components when the frame is horizontal (workshop).

Once the frame is fitted, the reveal may prevent frame components from being installed correctly.



8.7.2.1 CL frame component

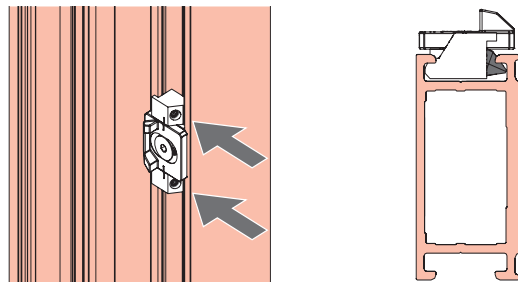
Installing the CL frame component

1. Move the CL frame component on the hinge side into the frame at the specified position (see installation drawing → 9 "Installation drawings" from page 248).

Fasten the CL frame component with two preassembled threaded pins.

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm



2. After the sash is joined to the frame, adjust the gasket compression → from page 304.



INFO

If the frame component is not adjusted, the profile may be warped.

8.7.2.2 Tilt-Only stay arm

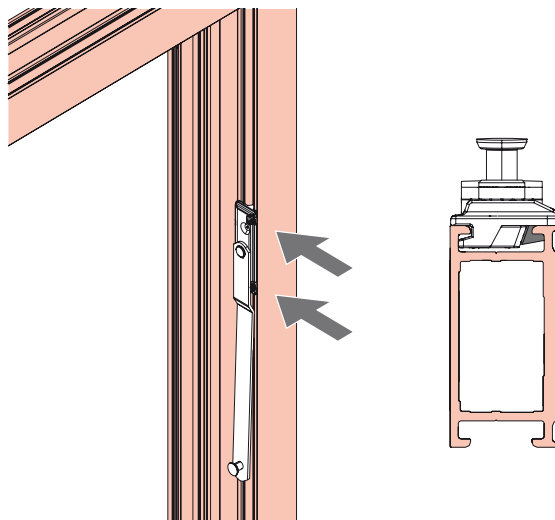
Installing the CL frame component

1. Swing the Tilt-Only stay arms into the frame at the specified position (see installation drawing → 9 "Installation drawings" from page 248).

Screw down the Tilt-Only stay arms with the two preassembled threaded pins.

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm



8.7.2.3 Rebate sash stay

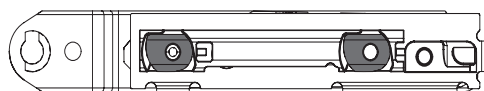
Installing the rebate sash stay

1. Align the clamping blocks.



INFO

For selecting the clamp strip version depending on the clamp strip dimensions = C (profile leg thickness) + J (groove inside width), → from page 37.

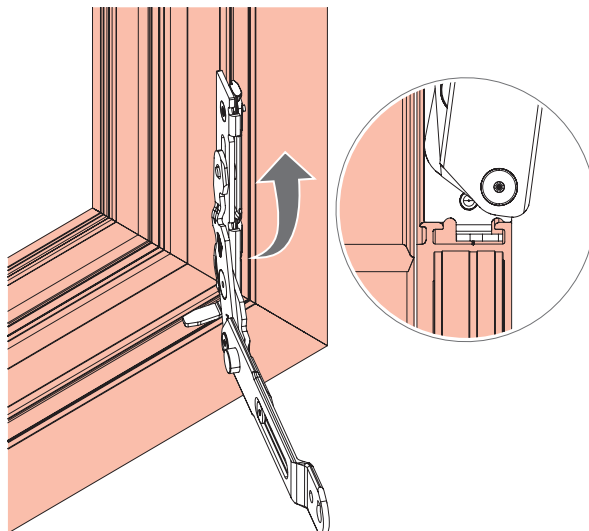


Installation

Tilt-Only hardware, handle at the top

Frame

2. Open the sash stay and swing the bearing into the profile so that the baseplate engages behind it.



3. Push the baseplate onto the profile so that it is level and tighten the preassembled screw [1].

Check that the sash stay is fitted securely.

Tighten the screw [2].

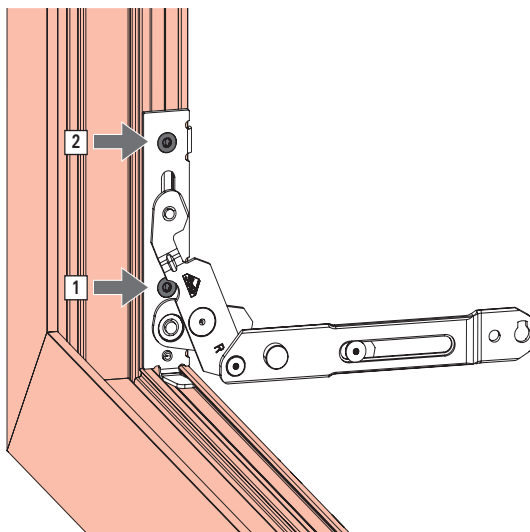
Tool: T20 hexalobular socket screwdriver

Torque: 4.5 – 6.0 Nm



INFO

- Depending on the strength of the profile, or with a base groove thickness > 2 mm, it may be necessary to predrill the area of the screw [2]. To do so, use the pivot rest / stay bearing jig or create the corresponding drilling pattern in mechanical production (→ *from page 35*).
- Note the screw sequence [1], [2].
- Install and remove the sash stay a maximum of two times.

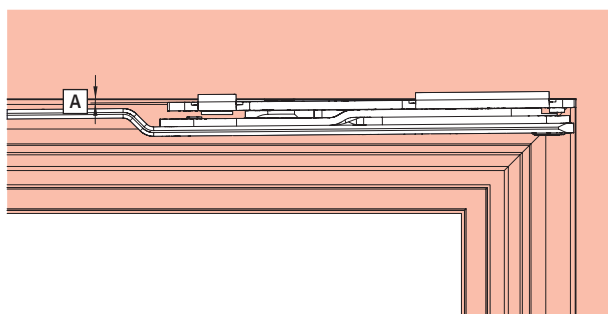


4. Close the sash stay.



INFO

Do not leave a gap between the baseplate and profile [A].





8.7.3 Joining the sash and frame



CAUTION

Heavy loads pose the risk of injury and property damage.

Lifting and carrying heavy loads in an uncontrolled manner may lead to physical injury and property damage.

- ▶ Transport and installation must be carried out by at least two people.
- ▶ Use transportation means. → 14 "Transport" from page 319

8.7.3.1 Mounting the rebate sash stay

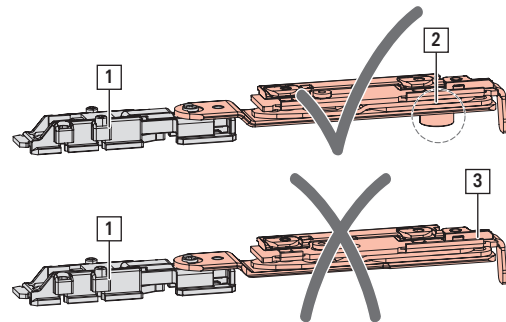


WARNING

Incorrect installation may pose a risk of death!

The combination of "rebate stay hinge [1]" installed with "rebate sash stay, couplable, with clamp strip [3]" can lead to hazardous situations or even cause the sash to fall.

- ▶ Only install the "rebate stay hinge [1]" in conjunction with the "rebate sash stay with clamp strip [2]".



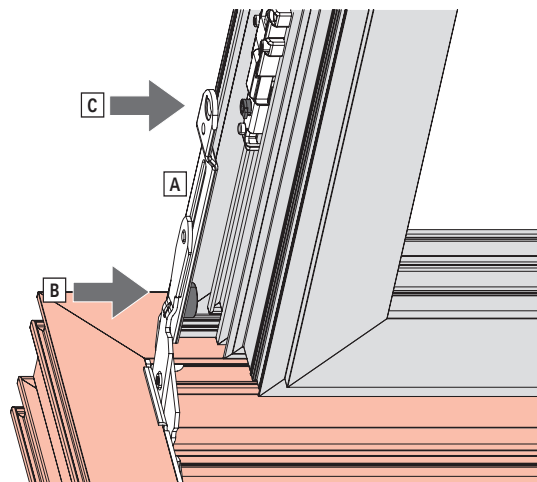
WARNING

An unsecured sash may pose a risk of death!

A missing connection can lead to hazardous situations or even cause the sash to fall.

- ▶ Check correct mounting.
- ▶ Lock by turning the cam 180°.

1. Open both rebate sash stays and guide them on the sash via the rebate stay hinge [A].
Insert the eccentric cam into the sash groove [B].
Guide the swivel cam on the rebate stay hinge through the drill hole in the two rebate sash stays [C].



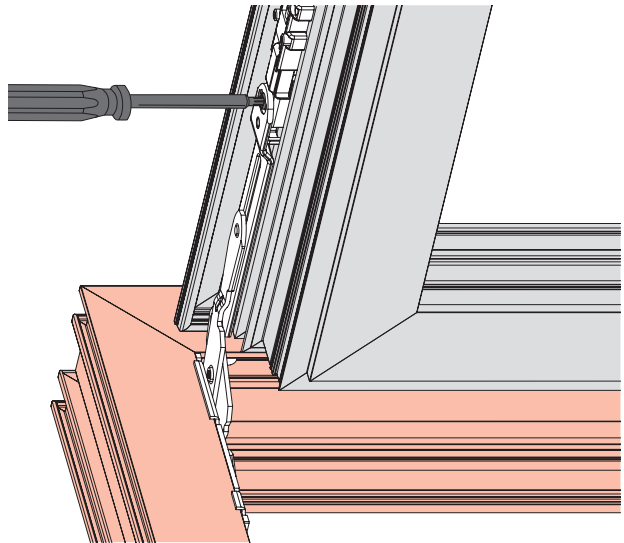
Installation

Tilt-Only hardware, handle at the top

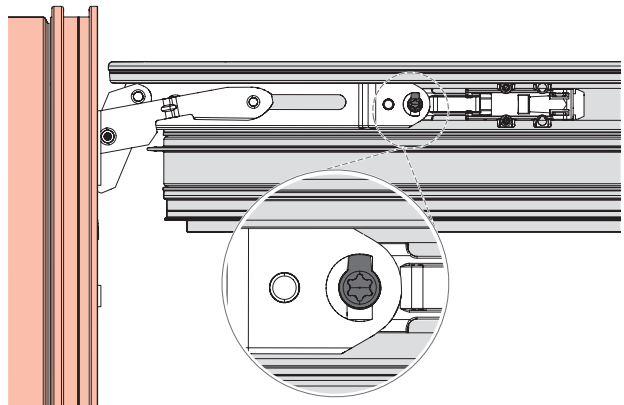
Joining the sash and frame

2. Lock the connection by turning the cams (right and left) 180°.

Tool: T25 hexalobular socket screwdriver



3. View from above, after locking.



8.7.3.2 Tilt-Only stay arm (TiSt)

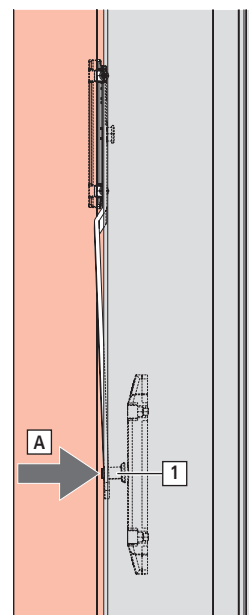
Connecting the Tilt-Only stay arm to the slide bar

1. In the tilted sash position, guide the scissor stay arm across the centre of the slide bar with the mounting pin [1] [A].



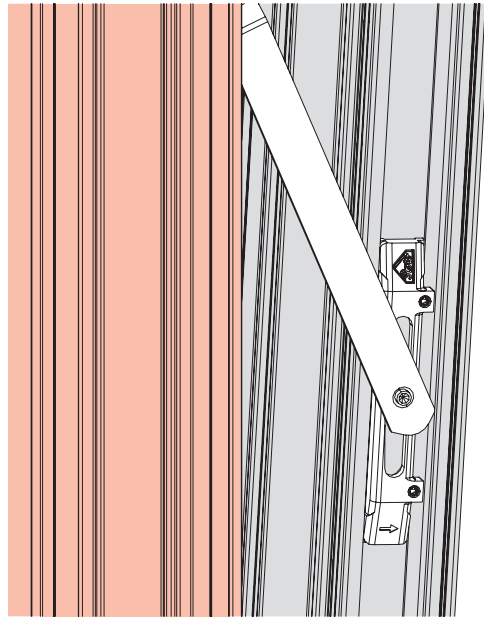
INFO

Secure the sash to prevent it from falling.





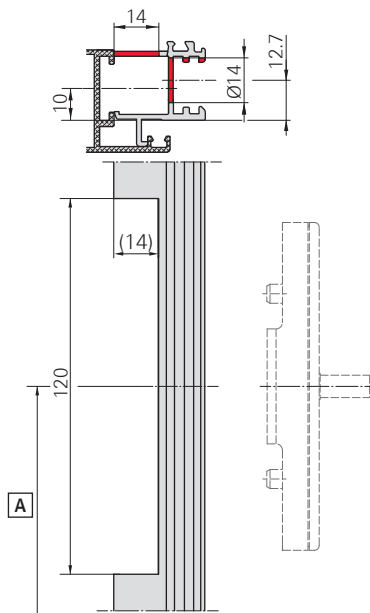
2. Insert the mounting pin in the slide bar and close the sash.



8.8 Floating-mullion hardware

8.8.1 Drilling and routing dimensions

8.8.1.1 FM espagnolette, internal

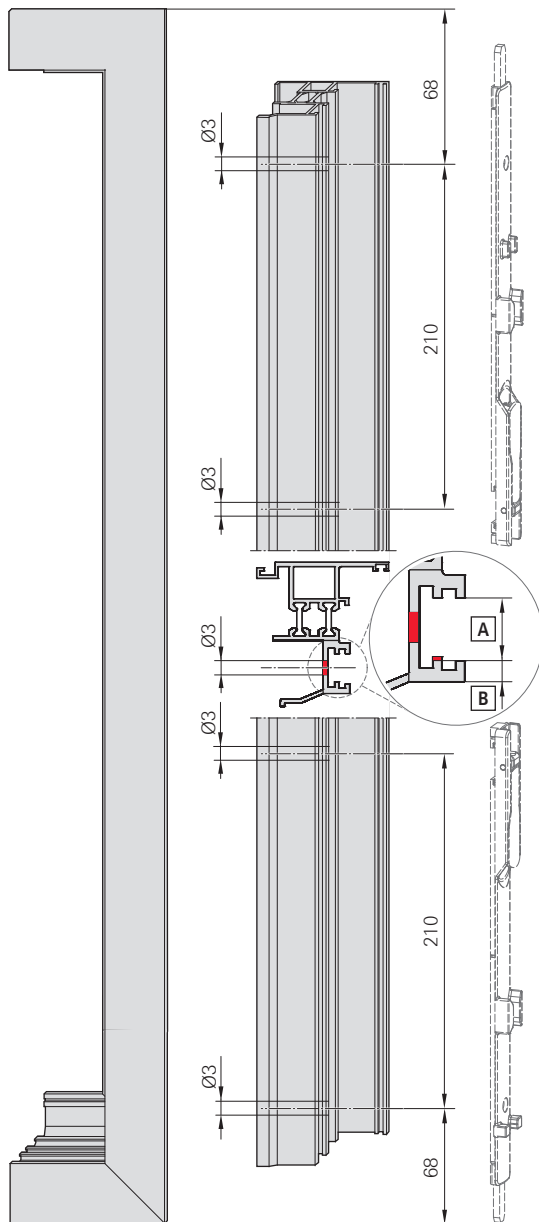


Perform routing in the surface-mounted floating-mullion profile.

[A] Floating mullion handle height (HH(FM))

Drill the hole:

1 x Ø 14 mm

8.8.1.2 Shootbolt

Drill holes:

4 x Ø 3 mm

[A] 14 mm (12 - 13.9 mm available upon request)

[B] Min. 3 mm, max. 4.2 mm



8.8.2 Sash

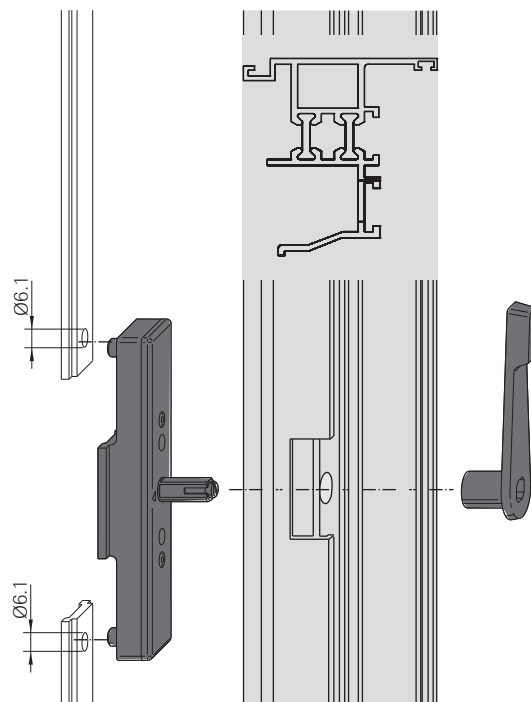
8.8.2.1 FM espagnolette

Installing the FM espagnolette

1. Connect the FM espagnolette to the sash components, insert into the sash profile and fasten using two preassembled threaded pins.

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm



2. Install the surface-mounted floating-mullion profile on the sash.

While doing so, guide the mount for the operating lever through the drill hole.

3. Install the operating lever on the FM espagnolette.

8.8.2.2 FM-Su espagnolette

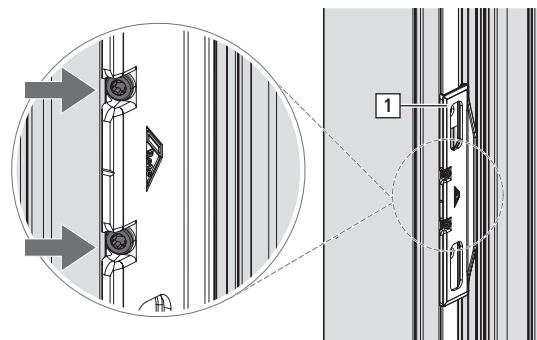
Installing the FM-Su espagnolette

1. Position the guide rail [1] → 9.6.5 "FM-R" from page 286.

Fasten with two preassembled threaded pins.

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm



Installation

Floating-mullion hardware

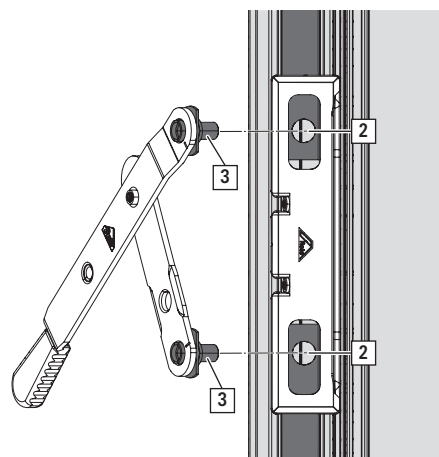
Sash

2. Insert the connecting rods.

Align the connecting-rod holes [2] in the centre of the guide rail recess.

Open the toggle lever until the mounting bolts [3] are spaced as far apart as the connecting-rod holes.

Optional for Ø 10 connecting-rod holes: place the compensating bushes included in the scope of delivery on the mounting bolts.



3. Turn the mounting bolts to the mounting position while aligning both retainers [4] so that they are flush.

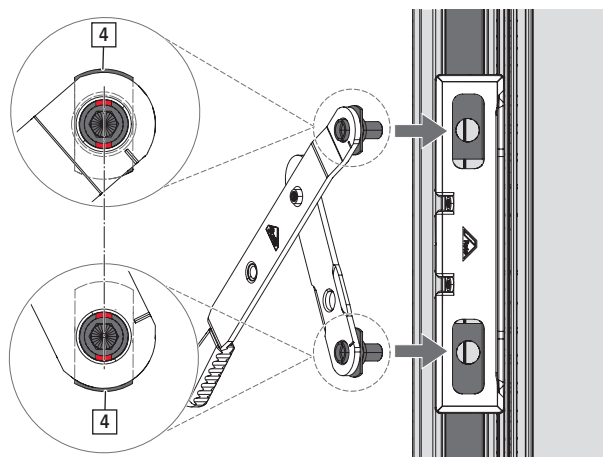
Tool: size 4 hex key



INFO

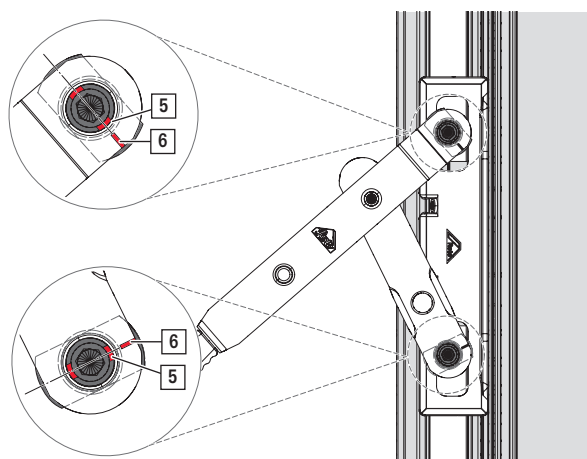
Turn the mounting bolts in the same direction up to a maximum of three times. Frequent turning will mean that a secure fit is no longer guaranteed.

Insert the mounting bolts on the toggle lever into the connecting-rod holes.



4. Turn both retainers on the mounting bolts to the fixing position. While doing so, align the notch of the bolts [5] so that it is in line with the notch in the toggle lever arm [6].

Tool: size 4 hex key



8.8.2.3 FM-SuN espagnolette

Installing the FM-SuN espagnolette

⇒ Connecting rods prepared → *from page 178.*

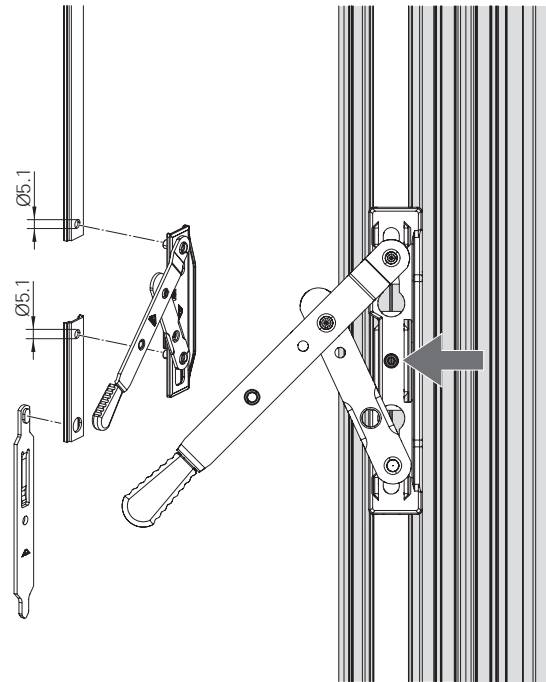
1. Install the guide rail with sash components in the sash.



2. Fasten the guide rail with a preassembled threaded pin.

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm



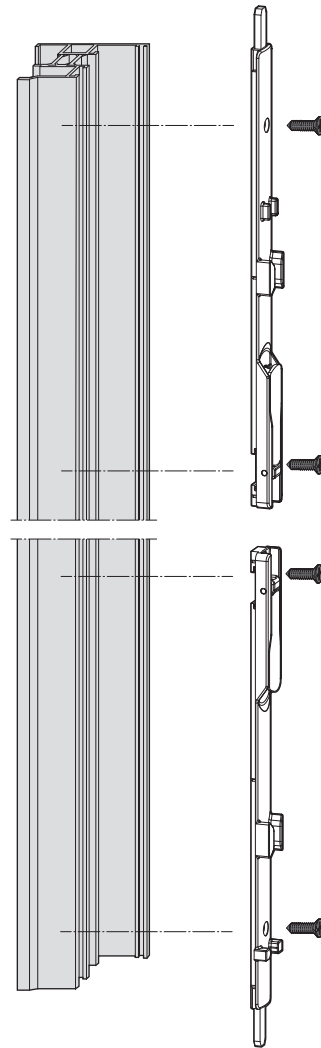
8.8.2.4 FM-Sh espagnolette

Installing the FM-Sh espagnolette

1. Insert the shootbolt into the sash profile.

Installation
Floating-mullion hardware
Sash

2. Screw the shootbolt down when locked.
Tool: size 4 hex key

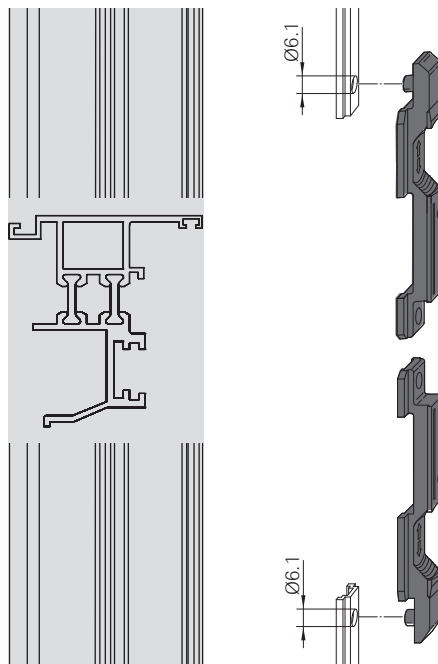




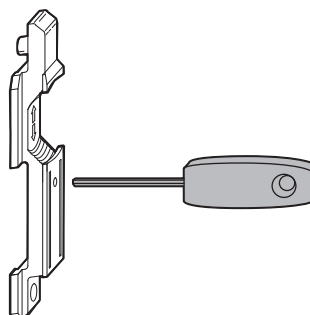
8.8.2.5 FM-R espagnolette

Installing the FM-R espagnolette

1. Connect the slider to the sash components and insert into the sash profile.



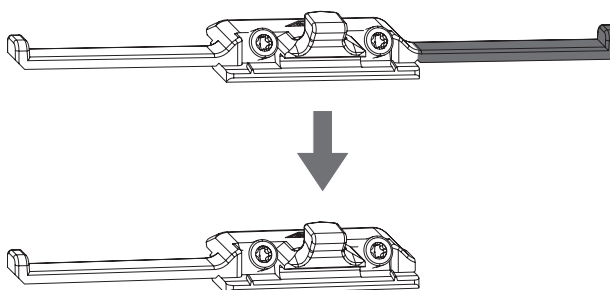
2. Stop the slider when locked.
Tool: size 2.5 hex key



8.8.2.6 Anti-lifting device in the floating-mullion window

Preparing the anti-lifting device for installation

1. Depending on whether the anti-lifting device is installed on the left or right, break off the bottom leg on the anti-lifting device (predetermined breaking point).



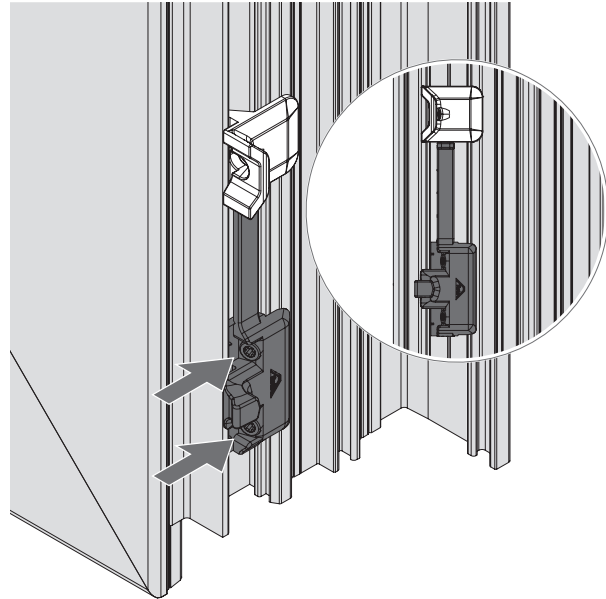
Installing the anti-lifting device

1. Place the anti-lifting device at the specified position with top leg on the striker (see installation drawing → 9.6.8 "FM, couplable / 150 kg" from page 289).

Fasten the anti-lifting device with two preassembled threaded pins.

Tool: T10 hexalobular socket screwdriver

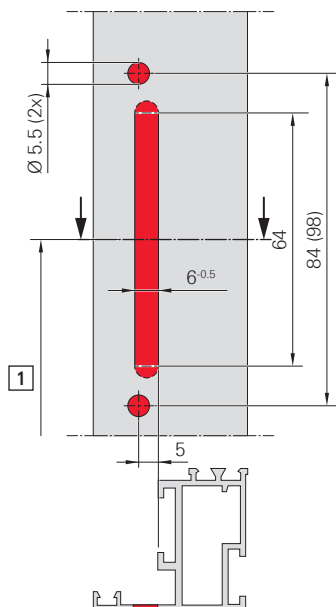
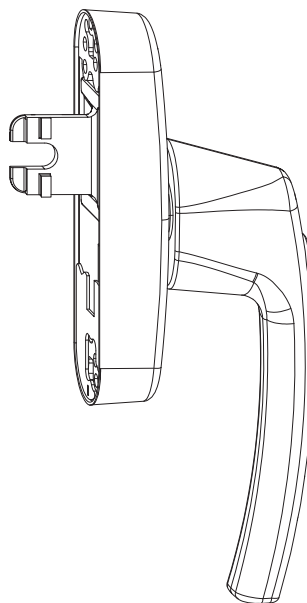
Torque: 2 – 2.5 Nm



8.9 Accessories

8.9.1 Drilling and routing dimensions

8.9.1.1 Roto Line | Geared-handle

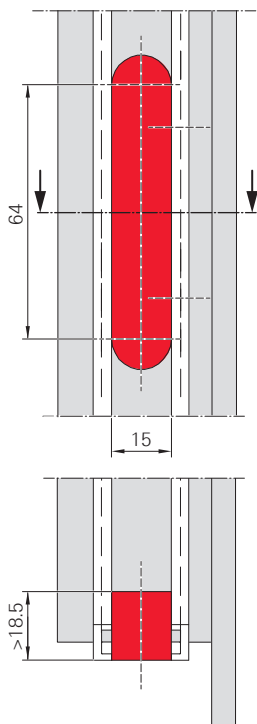
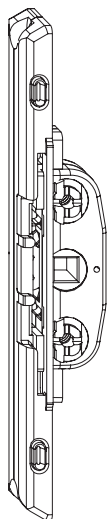


Drill holes for the handle's fork and attachment

[1] Handle height HH ≥ 260 mm

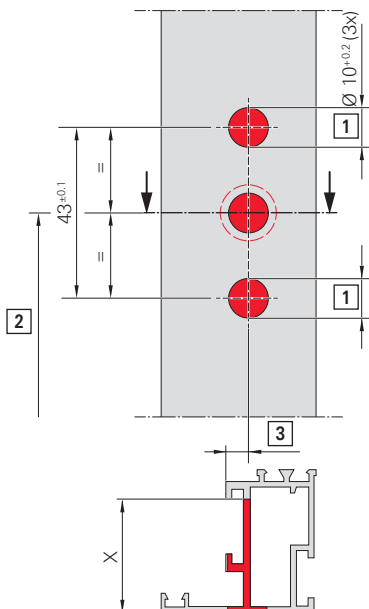
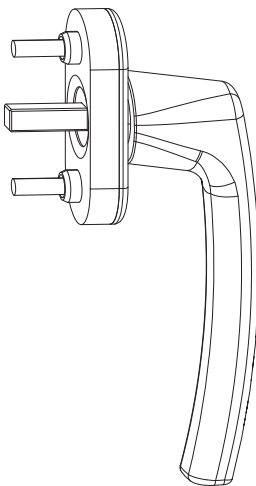


8.9.1.2 Flush-encased gearbox with / without mishandling device



Routing for the gearbox

8.9.1.3 Roto Line handle – standard



Drill holes for the handle's square spindle and lugs

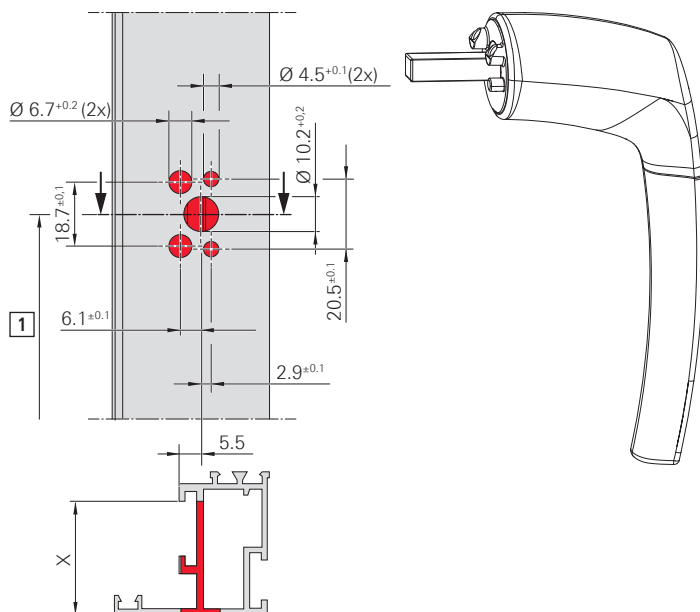
[1] Only drill through the first profile wall.

[2] Handle height = HH ≥ 260 mm

[3] Backset

X = drilling depth for square spindle

8.9.1.4 Flush-encased gearbox with handle without escutcheon

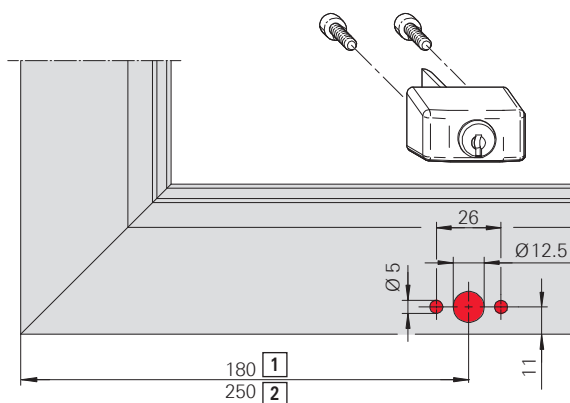


Drill holes for the handle's square spindle and lugs

[1] Handle height = HH ≥ 260 mm

X = drilling depth for square spindle

8.9.1.5 Turn lock

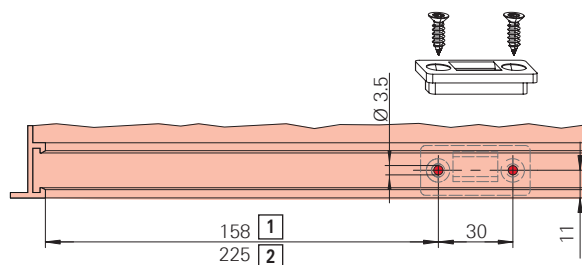


Drill holes for turn lock

[1] T&T

[2] TF

8.9.1.6 Locking plate set



Drill holes for locking plate

[1] T&T

[2] TF

8.9.2 Roto Handles

8.9.2.1 Handle without escutcheon



INFO

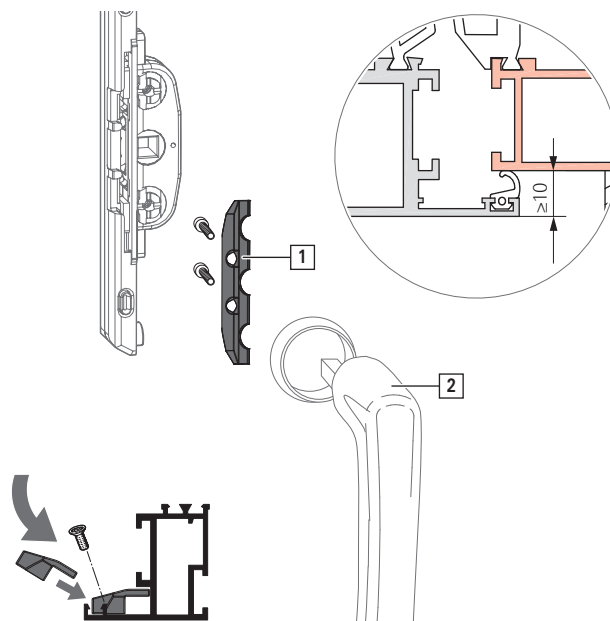
The handle without escutcheon can only be used on profile systems with an overlap height of ≥ 10 mm.



Installing the mounting plate with handle

⇒ The flush-encased gearbox must be installed → *from page 186*.

1. Swing the mounting plate [1] into the profile.
 Fasten the handle [2] through the mounting plate with two screws.
 Tool: T25 hexalobular socket screwdriver

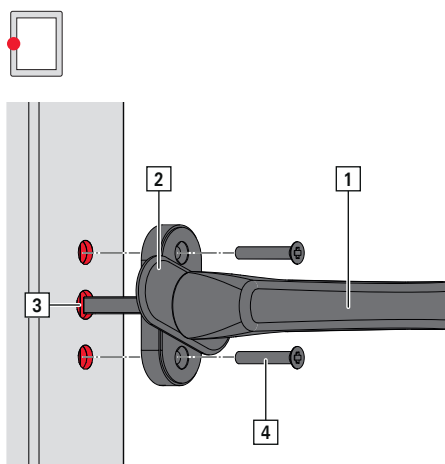


8.9.2.2 Roto Line | window handle, standard

Installing the handle

⇒ The flush-encased gearbox must be installed → *from page 186*.

1. Move the handle [1] to the turn position.
2. Rotate the cover [2] on the handle 90°.



3. Insert the handle into the sash [3].
4. Fasten the handle with two screws [4].
 Overcome the resistance of the transport safety device while doing so.
5. Rotate the cover on the handle 90°.

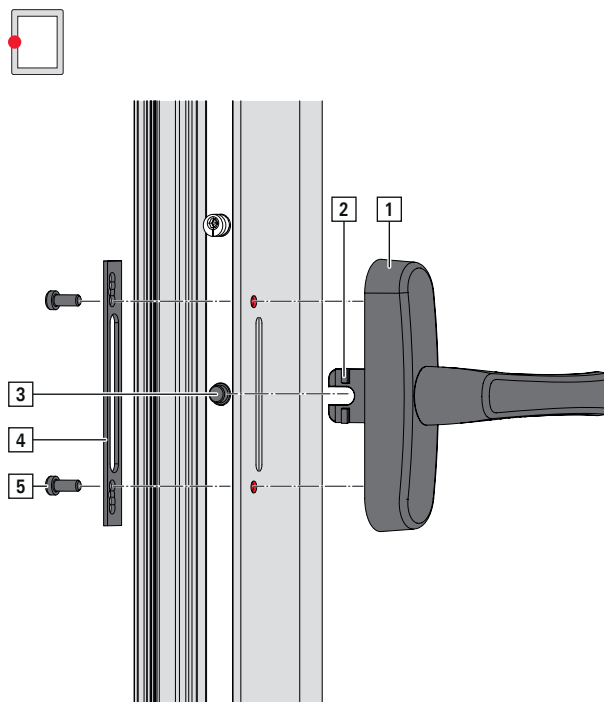
8.9.2.3 Roto Line | Geared-handle

Installing the espagnolette

⇒ The connector must be installed → *from page 184.*

⇒ With a lockable handle, the SEC espagnolette protection must be installed → *from page 185.*

1. Move the handle to the turn position.
2. Place the espagnolette [1] on the sash from the inside of the sash.
The fork [2] engages in the connector bolt [3].
Fit the espagnolette support [4] from the outside of the sash to the espagnolette on the sash.
- a. Align the espagnolette support on the drill holes.
- b. Fasten the espagnolette with screws [5].



3. Turn the handle to check that it runs smoothly.
4. Move the handle to the closed position.

8.9.3 Turn lock and locking plate set

Installing the turn lock

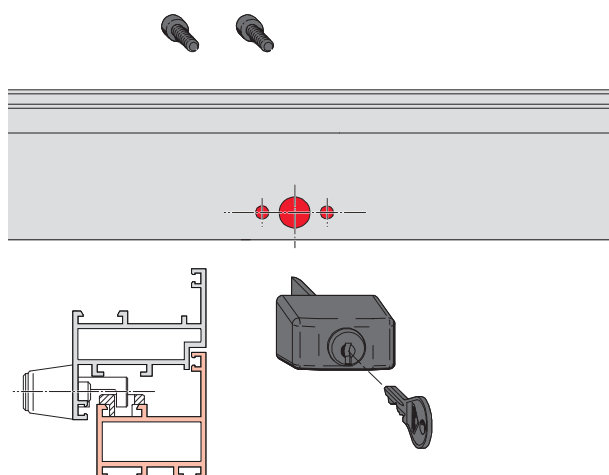
1. Fasten the turn lock to the sash with two screws.
Tool: T25 hexalobular socket screwdriver



INFO

When installing the turn lock, pay attention to the position of the lock hook.

Insert the key into the lock.

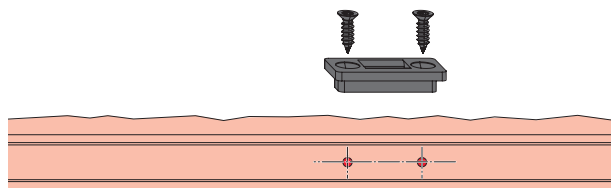




Installing the locking plate set

1. Fasten the locking plate to the frame with two screws.

Tool: T25 hexalobular socket screwdriver



8.9.4 Bullet-catch set with packer for bullet-catch cam



INFO

The bullet catch can be installed with or without a connecting rod.

On floating-mullion elements, the bullet catch is only intended for horizontal installation in the second opening Turn-Only sash and must be installed with a packer.

Producing the slot in the connecting rod

1. Produce the slot in the connecting rod before installation (see installation drawing → *from page 293*).

Installing the bullet-catch cam with / without packer

⇒ Predrill the sash profile with a Ø 3.0 drill.

⇒ Floating mullion: bullet-catch cam with packer only for installation in second opening Turn-Only sash.

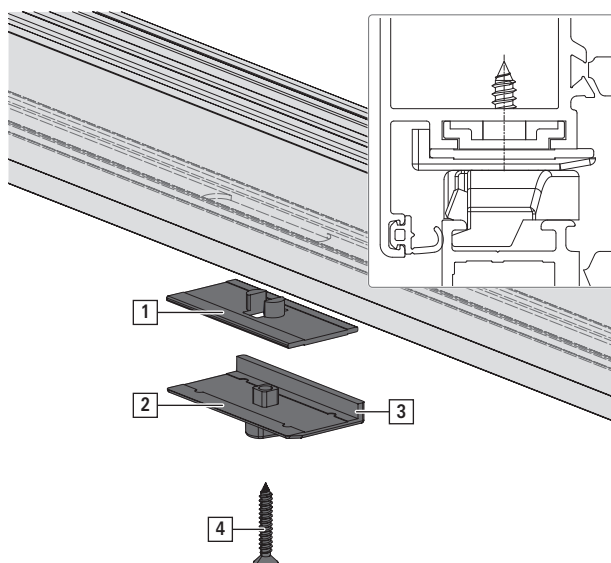
1. If necessary, connect the packer [1] to the bullet-catch cam [2] from below.

Position the bullet-catch cam in the slot on the connecting rod (see installation drawing → *from page 293*). Pay attention to the alignment of the profile leg [3].

Fasten the bullet-catch cam with one screw [4].

Tool: T25 hexalobular socket screwdriver

Torque: 1.5 – 2.0 Nm



Installing the bullet catch

⇒ Horizontal: hardware installed without connecting rod / with slot in bottom connecting rod.

⇒ Vertical: hardware installed with slot in connecting rod above espagnolette.

Installation

Accessories

Bullet-catch set with packer for bullet-catch cam

1. Position the bullet catch [1] in the frame groove (see installation drawing → *from page 293*).

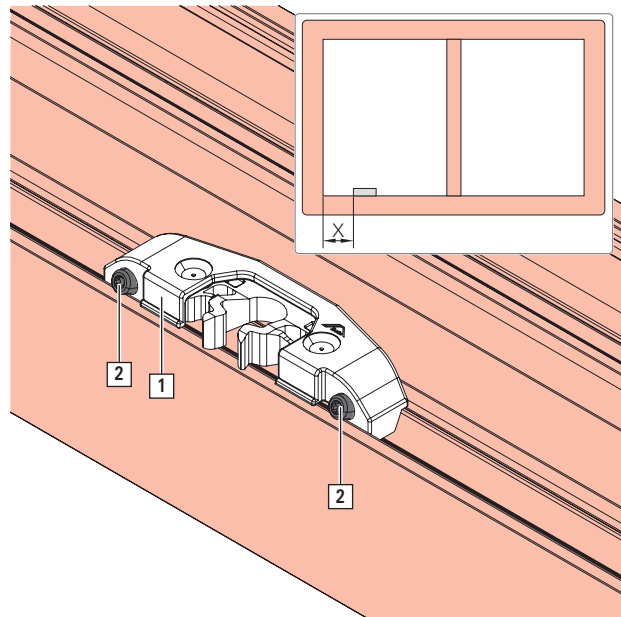
Positioning dimensions for second opening Turn-Only sash

Floating-mullion variant X	
SW2 = sash width of second opening sash	
FM, FM-Su, FM-R	SW2-106
FM-SuN, FM-Sh	SW2-106-25
FM, couplable	SW2-106-150

Fasten the bullet catch with two preassembled threaded pins [2].

Tool: T10 hexalobular socket screwdriver

Torque: 1.5 – 2.0 Nm

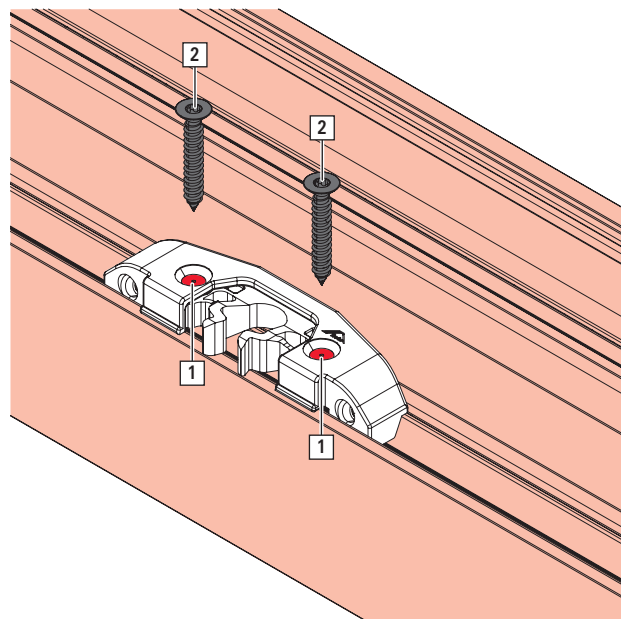


2. Optional fastening with two additional screws.
⇒ Predrill the frame profile with a Ø 3.0 drill.
Pierce the cast skin [1] of the screw holes using a suitable tool (e.g. screwdriver).

Fasten the bullet catch with two screws [2].

Tool: T25 hexalobular socket screwdriver

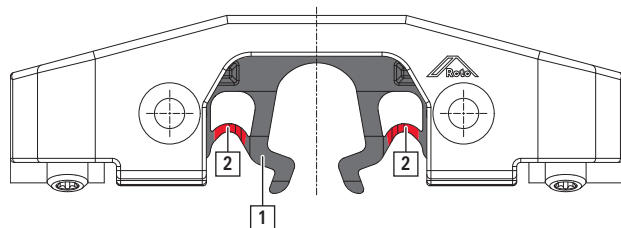
Torque: 1.5 – 2.0 Nm



Reducing the bullet catch latching forces

⇒ The latching forces are too strong.

1. Remove the bullet catch.
Remove the spring element [1].
Detach the additional supports [2] using a suitable tool (e.g. side cutting pliers).





8.9.5 Turn restrictor



DANGER

Incorrect installation and loading poses a risk of death!

The sash can fall out if a different turn restrictor is used than the one specified in this document or if the end stops are improperly overloaded, for example by leaning on them.

- ▶ Use only the turn restrictors mentioned in this document.
- ▶ Do not lean against the window when it is open.



INFO

Comfort component

Not a security component in accordance with DIN EN 13126-5

Use turn restrictors → 3.4 "Minimum sash widths and heights" from page 35

- When window sashes could hit against window reveals or aluminium supports uncontrollably (e.g. due to wind) in such a way as to damage or destroy the hardware or profiles.
- In public buildings.
- With opening angles up to max. 90°.



INFO

Insert all sash components (e.g. sash bearing, stop, etc.) before installing the corner hinge.

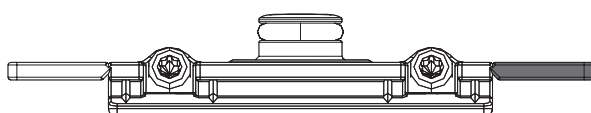
Check the end position of the sash rotation and correct it if necessary by moving the sash component slightly.

8.9.5.1 Turn restrictor with stop



INFO

For an opening angle of 94°, break either the right or left leg of the turn restrictor frame component before installation.



1. Position the frame bearing [1] in the frame groove directly adjacent to the pivot rest and fasten with two preassembled threaded pins so that it is at least flush.

Tool: T10 hexalobular socket screwdriver

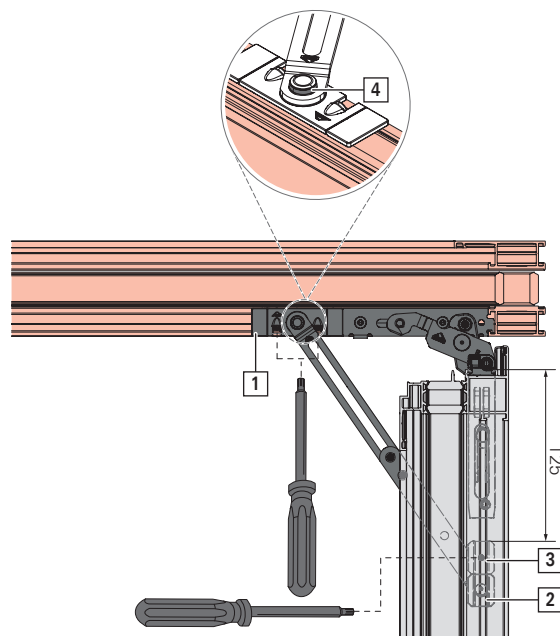
Torque: 2 – 2.5 Nm

2. Insert the sash bearing [2] in the sash groove and position it.
3. Insert the stop [3] in the sash groove, position it and fasten it with the preassembled threaded pin.

Tool: T10 hexalobular socket screwdriver

Torque: 2 – 2.5 Nm

4. Push the turn restrictor arm above the rubber ring [4] on the frame bearing swivel pin.



INFO

Maximum opening width for the turn restrictor:
approx. 90°

8.9.5.2 Turn restrictor, braked, damped

1. Position the frame bearing in the frame groove directly adjacent to the pivot rest and fasten with two preassembled threaded pins so that it is at least flush [1].
 Tool: T10 hexalobular socket screwdriver
 Torque: 2 – 2.5 Nm
2. Position the sash bearing in the sash groove and fasten with two screws [2].
 Tool: T10 hexalobular socket screwdriver
 Torque: 2 – 2.5 Nm
3. Fasten the pull rod to the frame bearing using the mushroom-head screw provided [3].
 Tool: T10 hexalobular socket screwdriver
 Torque: 2 – 2.5 Nm

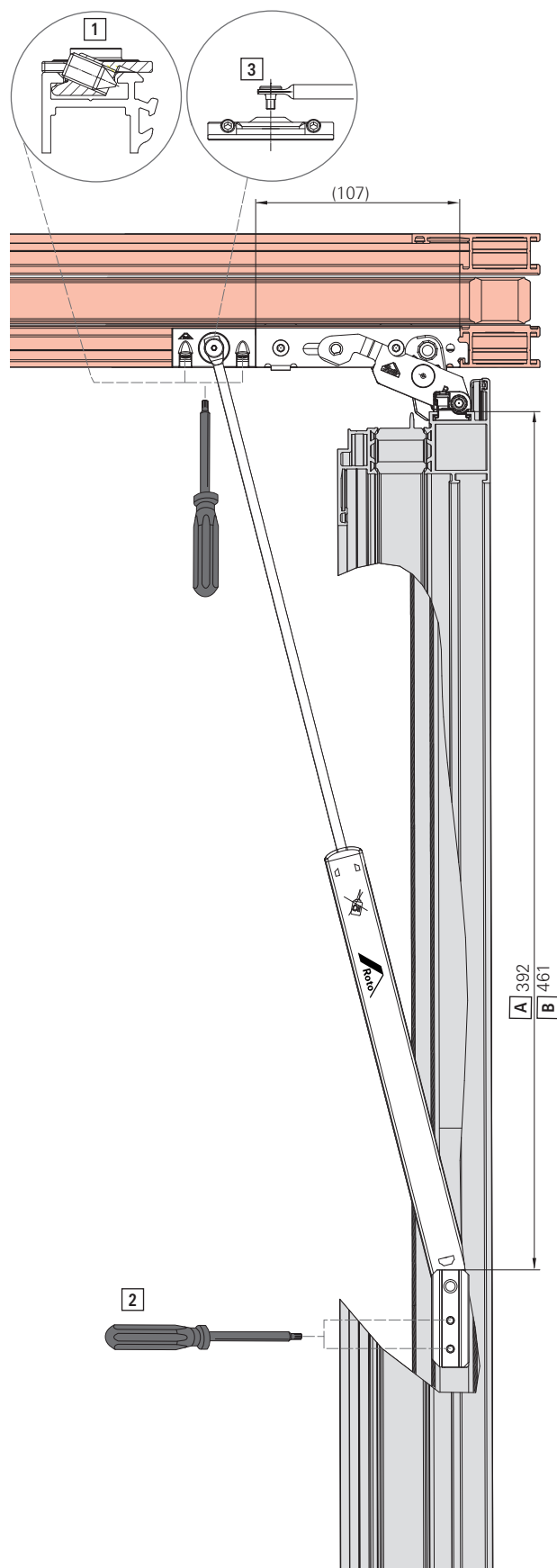


INFO

Maximum opening width for the braked, damped turn restrictor:

Size 1: approx. 63°

Size 2: approx. 90°



[A] Size 1

[B] Size 2



8.9.6 Night vent



INFO

Check all dimensions and functions during demo assembly prior to series production.

Installing the night vent

1. Prepare the connecting rod (see installation drawing of night vent without and with additional stay arm for T&T and TiSt).

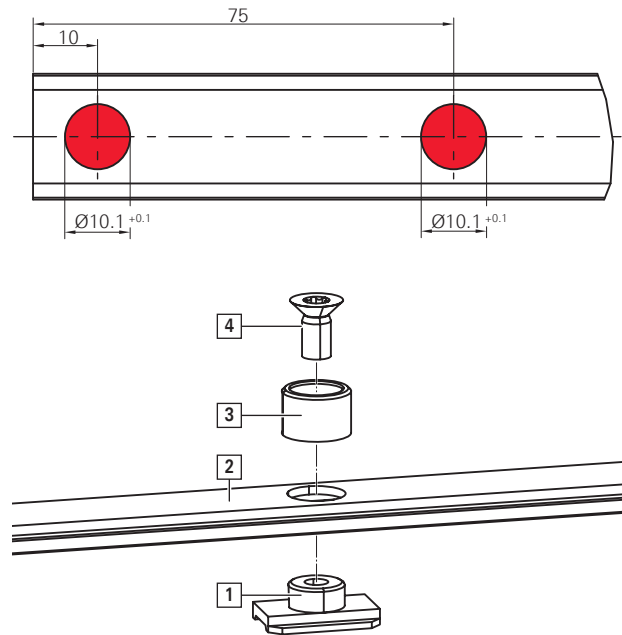
T&T = connecting rod CR3: drill the hole:

1 x $\varnothing 10.1^{+0.1}$ mm

TiSt = connecting rod CR1 and CR2: drill holes:

Each 1 x $\varnothing 10.1^{+0.1}$ mm

2. Secure the coupler component [1] with connecting rod [2], night vent locking cam [3] and one screw [4].



3. Insert the connecting rod with components (depending on the corresponding opening type and additional stay arm).



INFO

If the corner drive with mishandling device cannot be installed, a flush-encased gearbox with mishandling device must be fitted.

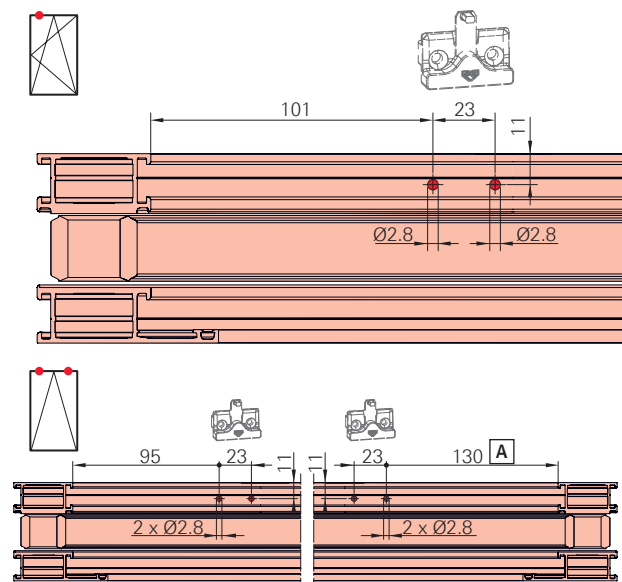
4. Drill the inside of the frame.
Drill holes:
2 x $\varnothing 2.8$ mm, at least 23 mm deep.



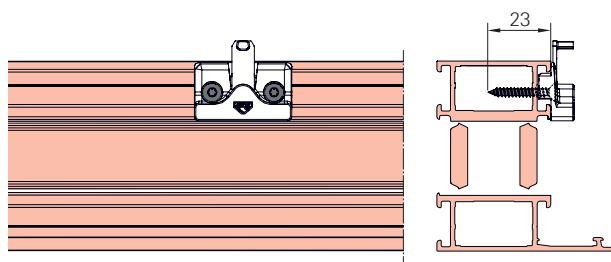
INFO

Note that the drill hole dimensions for T&T differ from those for TiSt.

[A] An additional night vent is recommended with $SW \geq 1000$ mm (for TiSt)



5. Fasten the night vent with two screws.
 Tool: T15 hexalobular socket
 Torque max. 1.0 Nm



8.9.7 Load transfer

The spring in the load transfer permanently takes a load of approximately 60 to 80 kg off the pivot rest. For this, it is necessary to pre-tension the spring to a certain length. This applies regardless of the set height of the sash. The load is relieved from the pivot rest over the entire service life of the hardware components, also taking account of settlement and wear.

Installing the load transfer

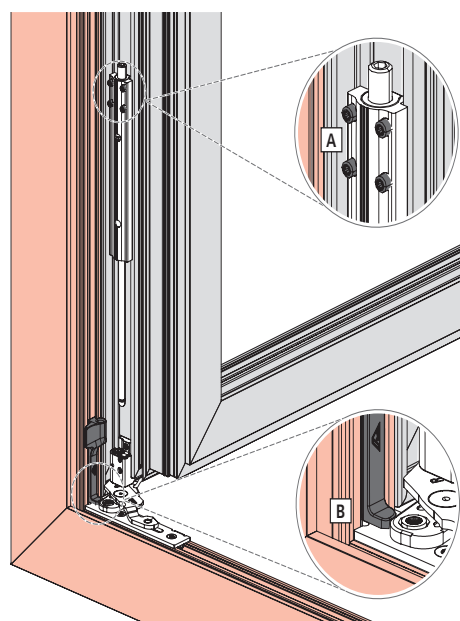


INFO

Sash installation with load transfer (S.kg 80 kg (T-O) / 100 kg (T&T) up to 180 kg).

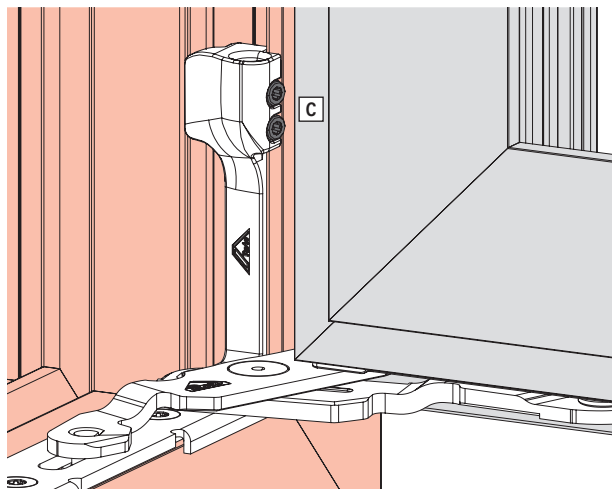
Do not use load transfer with S.kg $\leq$ 80 kg.

1. Insert the load transfer sash component (see installation drawing → 9 "Installation drawings" from page 248) into the sash groove and fasten it with four preassembled threaded pins [A].
 Tool: T10 hexalobular socket screwdriver
 Torque: 2 – 2.5 Nm
 Place the load transfer frame bearing onto the pivot rest baseplate without leaving a gap [B].





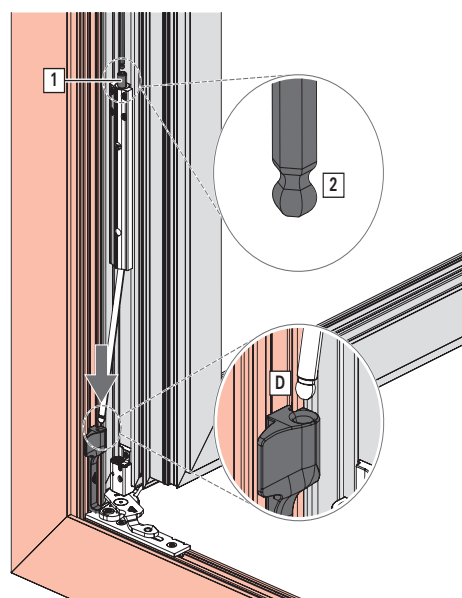
2. Fasten the load transfer frame bearing with two preassembled threaded pins [C].



3. Position the load transfer support rod over the recess in the installed frame bearing [D].

Use the adjusting screw [1] to lower the support rod clockwise, until it is securely seated in the recess of the frame bearing.

Tool: hex key (with ball-shaped head [2]) size 4



4. Adjust the load transfer pre-tensioning. To do so, use a 4 mm hex key to adjust the load transfer at the adjusting screw with the sash in the open position (90°).

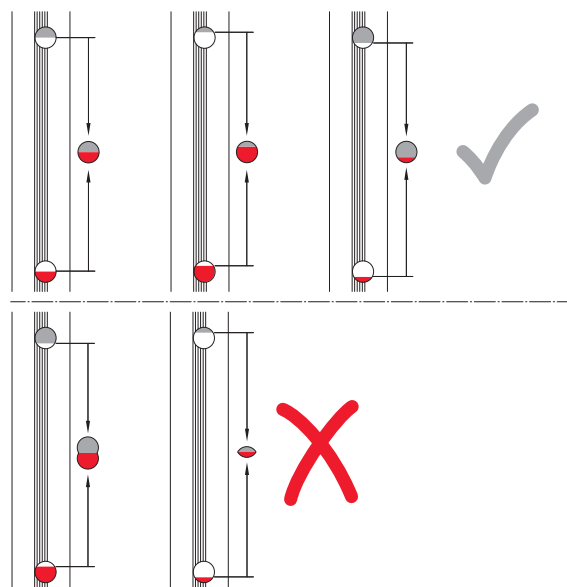
Adjust the adjusting screw so that a whole circle is produced by adding together the red and silver partial circles. Check at the view windows.



INFO

Only set and adjust the load transfer after the window has been installed on the construction site.

If the load transfer is adjusted before the window is installed, the window may only be transported upright and with the glazing installed.



9 Installation drawings

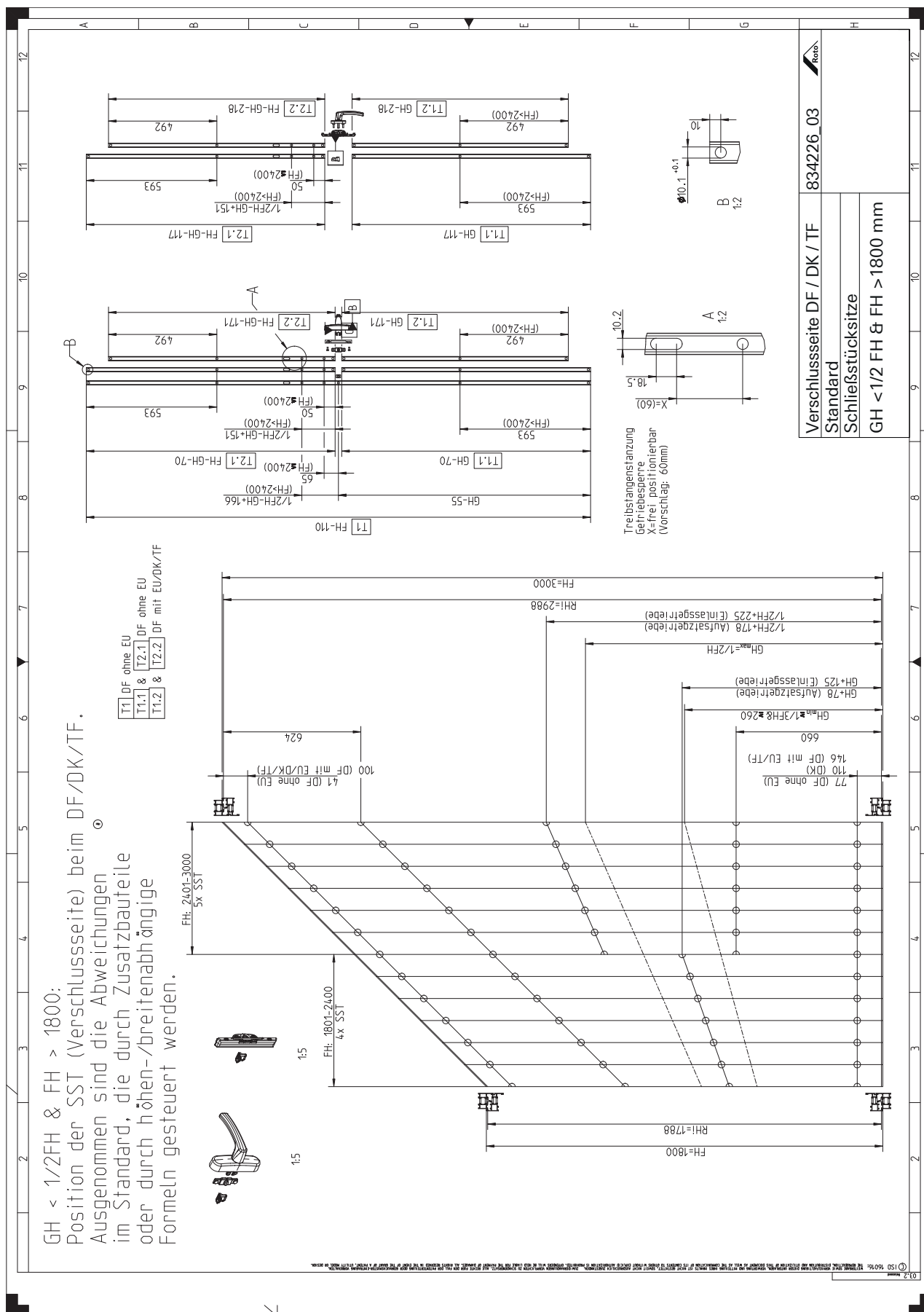
9.1 Striker positions

9.1.1 Explanation

The following markings are used in the installation drawings to emphasise references and other elements:

Marking	Translation
Aufsatzgetriebe	Geared-handle
Ausgenommen sind die Abweichungen im Standard, die durch Zusatzbauteile oder durch höhen-/breitenabhängige Formeln gesteuert werden.	The exception is deviations in the standard version, which are controlled by additional components or by height- / width-dependent formulas.
Einlassgetriebe	Flush-encased gearbox
DF ohne EU	Turn-Only sash without corner drive
DF mit EU	Turn-Only sash with corner drive
DK	Tilt&Turn
FH	Sash height
GH	Handle height
GH < 1/2 FH & FH > 1800: Position der SST (Verschlussseite) beim DF / DK / TF bis 130 kg	Handle height < 1/2 sash height and sash height > 1800: position of ST (locking side) for T-O / T&T / TF up to 130 kg
max	Maximum
min	Minimum
RHi	Frame height, internal
SST	Striker
Standardposition der SST (Verschlussseite) beim DF / DK / TF. (siehe auch Einbauzeichnungen)	Standard position of strikers (locking side) for T-O / T&T / TF (also see installation drawings).
Treibstangenstanzung Getriebesperre X=frei positionierbar (Vorschlag: 60 mm)	Connecting rod punched hole for espagnolette lock X=freely positionable (suggestion: 60 mm)

Standard – depending on HH and SH





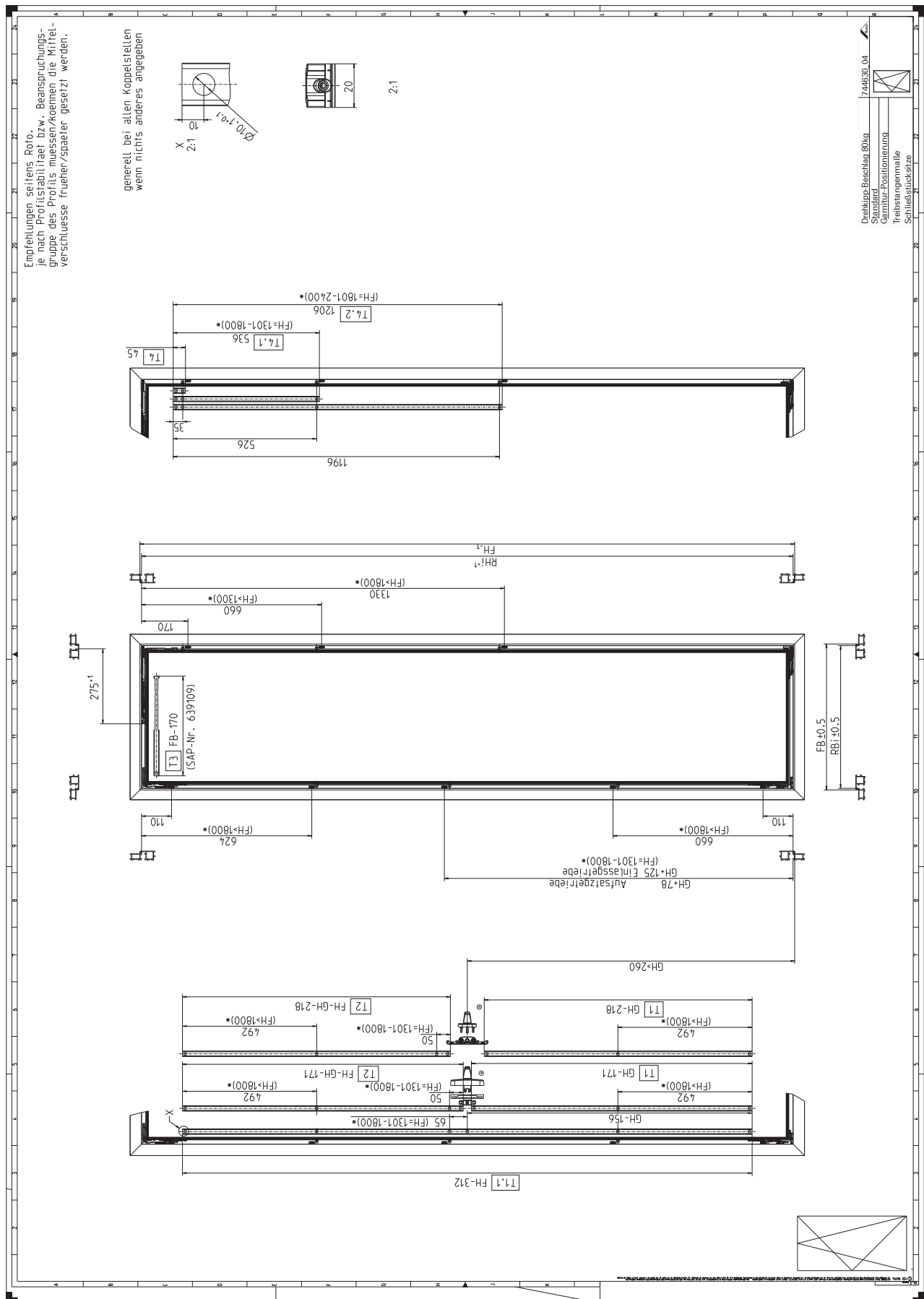
9.2 Tilt&Turn hardware

9.2.1 Explanation

The following markings are used in the installation drawings to emphasise references and other elements:

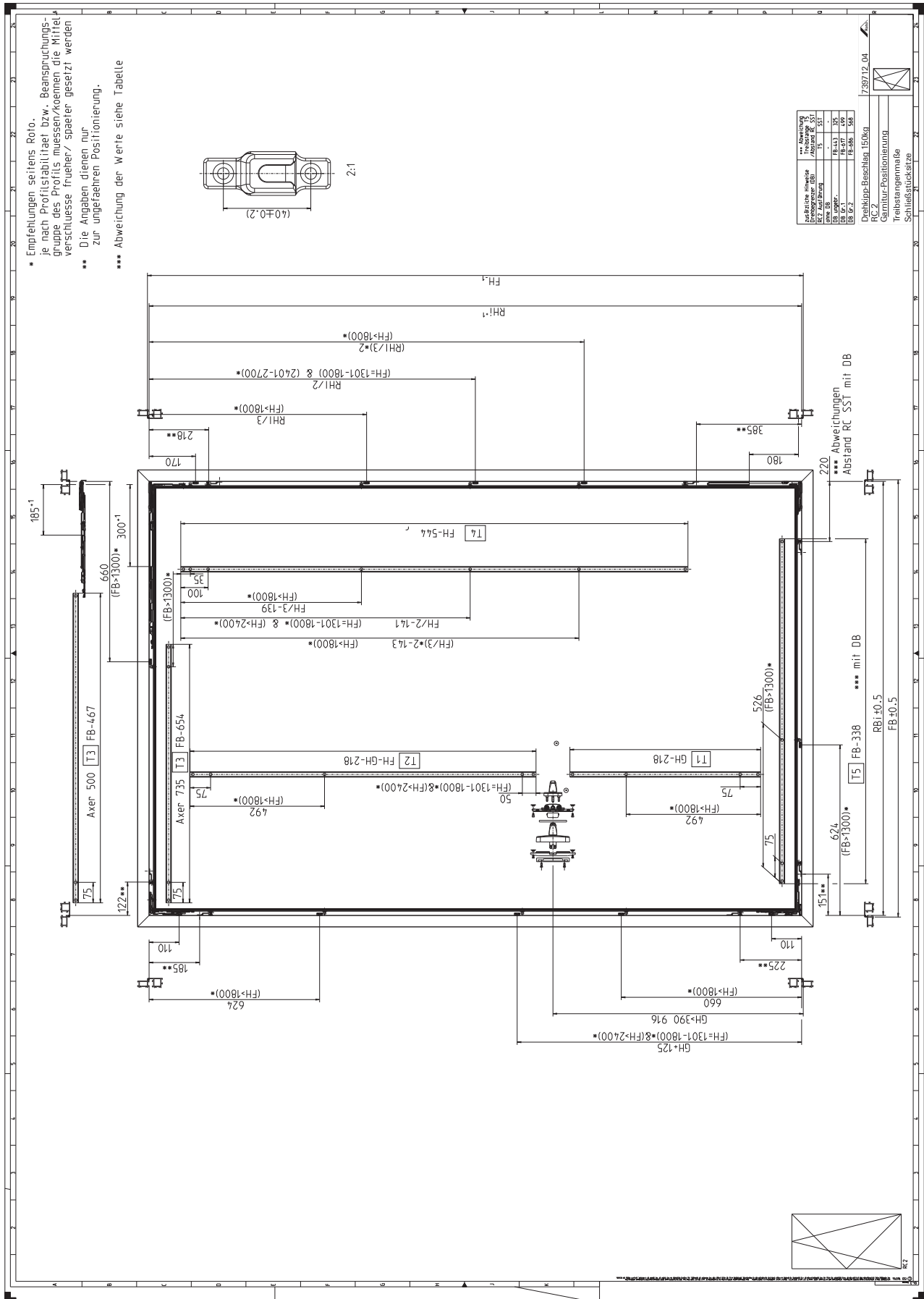
Marking	Translation
Abweichungen Abstand RC SST mit DB	Deviations from distance SEC striker with turn restrictor
Abweichung der Werte siehe Tabelle	Refer to the table for deviations in the values
Abweichung Treibstange T5/Abstand RC SST	Deviation from connecting rod T5 / distance SEC striker
Aufsatzgetriebe	Geared-handle
Ausführung	Version
Axer	Sash stay
Bauteil mit Blattfeder muss griffseitig montiert werden.	Component with leaf spring must be installed on the handle side.
Beim Verbauen der Zweitschere muss bei der Falzluftreduzierung, entsprechend der Drehrichtung des Flügels, der rechte bzw. linke Steg abgetrennt werden.	When fitting the additional stay arm, the right or left profile leg must be detached for rebate-clearance reduction depending on the direction of rotation of the sash.
DB Gr. ...	Turn restrictor size ...
DB ungebr.	Turn restrictor, unbraked (with stop)
Die Angaben dienen nur zur ungefähren Positionierung.	The information is for approximate positioning only.
Drehkipp-Beschlag	Tilt&Turn hardware
Einlassgetriebe	Flush-encased gearbox
Empfehlungen seitens Roto : je nach Profilstabilität bzw. Beanspruchungsgruppe des Profils müssen / können die Mittelverschlüsse früher / später gesetzt werden.	Recommendations from Roto: depending on the profile stability or profile loading group, the centre locks must / can be put in place at an earlier / later point.
FB	Sash width
FH	Sash height
Garnitur-Positionierung	Set positioning
generell bei allen Koppelstellen, wenn nichts anderes angegeben	Generally for all coupling points, unless otherwise specified
GH	Handle height
kg	Kilograms
mit DB	With turn restrictor
ohne DB	Without turn restrictor
RBi	Frame width, internal
RC2	RC 2
RC3	RC 3
RHi	Frame height, internal
SAP-Nr.	Material number
Schließstücksitze	Striker positions
SH-Schließstück für Kipplüftung besitzt R/L Kennzeichnung. In einem Fenster werden 3 Stück verbaut.	The security striker for tilt ventilation has a right / left marking. Three units are installed in a window.
SST	Striker
Standard	Standard
T	Connecting rod
Treibstangenmaße	Connecting rod
zusätzliche Hinweise Drehbegrenzer (DB)	Additional information on the turn restrictor (TR)
Zweitschere	Additional stay arm

9.2.2 T&T | 80 kg



[illegible]

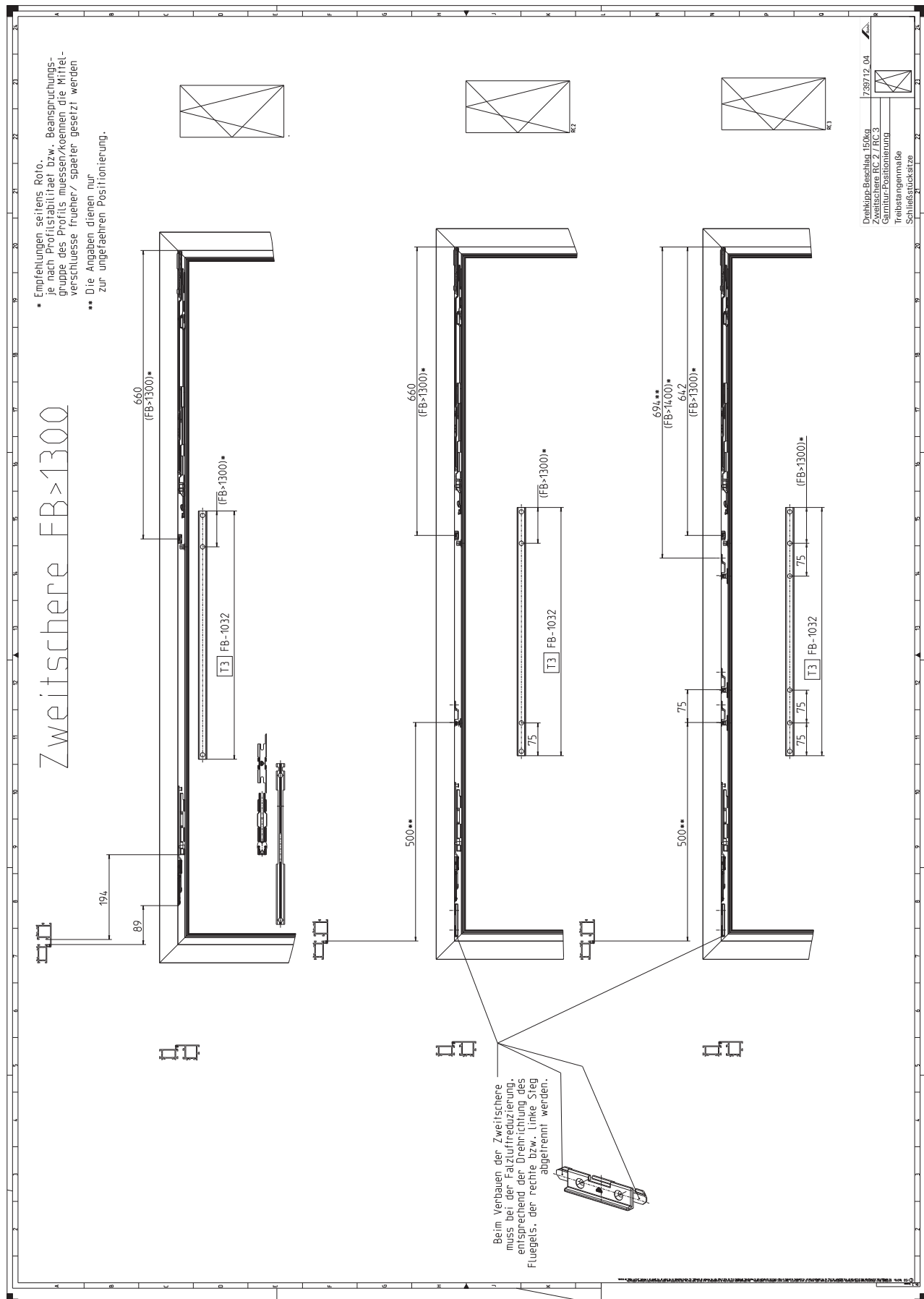
9.2.4 T&T | 150 kg | RC 2



Technical drawing of a door frame assembly, showing dimensions and components. The drawing includes a side view (2:1) and a top view. The side view shows the door frame with dimensions: 185" (top), 122" (left), 110" (bottom), 624" (right), 660" (total height), 712" (total width), 75" (top offset), 75" (bottom offset), 75" (left offset), 75" (right offset), 75" (top offset), 75" (bottom offset), 75" (left offset), 75" (right offset). The top view shows the door frame with dimensions: 185" (top), 122" (left), 110" (bottom), 624" (right), 660" (total height), 712" (total width), 75" (top offset), 75" (bottom offset), 75" (left offset), 75" (right offset), 75" (top offset), 75" (bottom offset), 75" (left offset), 75" (right offset). The drawing includes a table of dimensions and a list of components.

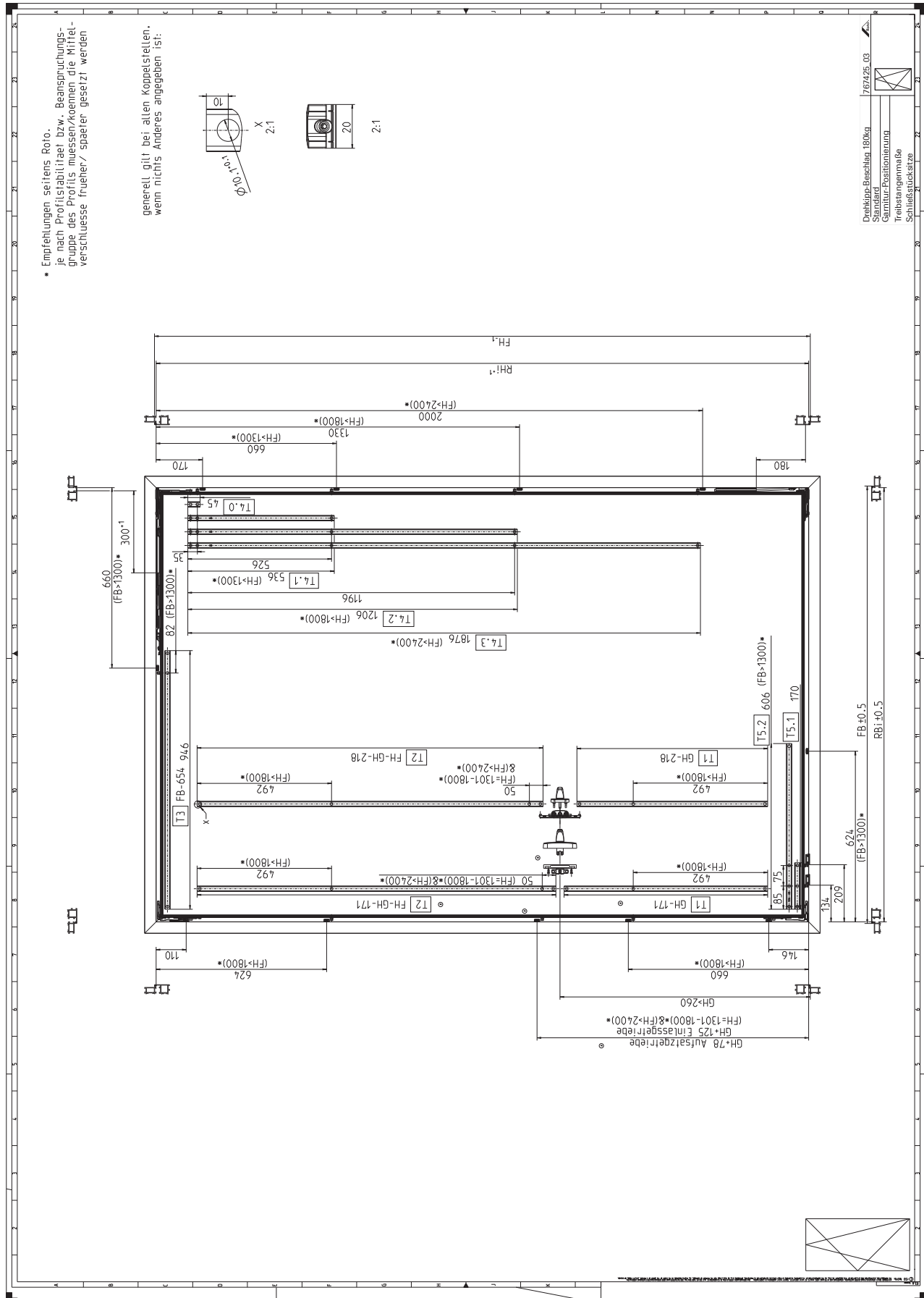
Abbildung	Bezeichnung	Maß	Einheit
1	Abbildung	185"	mm
2	Abbildung	122"	mm
3	Abbildung	110"	mm
4	Abbildung	624"	mm
5	Abbildung	660"	mm
6	Abbildung	712"	mm
7	Abbildung	75"	mm
8	Abbildung	75"	mm
9	Abbildung	75"	mm
10	Abbildung	75"	mm
11	Abbildung	75"	mm
12	Abbildung	75"	mm
13	Abbildung	75"	mm
14	Abbildung	75"	mm
15	Abbildung	75"	mm
16	Abbildung	75"	mm
17	Abbildung	75"	mm
18	Abbildung	75"	mm
19	Abbildung	75"	mm
20	Abbildung	75"	mm
21	Abbildung	75"	mm
22	Abbildung	75"	mm
23	Abbildung	75"	mm
24	Abbildung	75"	mm
25	Abbildung	75"	mm
26	Abbildung	75"	mm
27	Abbildung	75"	mm
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35	Abbildung	75"	mm
36	Abbildung	75"	mm
37	Abbildung	75"	mm
38	Abbildung	75"	mm
39	Abbildung	75"	mm
40	Abbildung	75"	mm
41	Abbildung	75"	mm
42	Abbildung	75"	mm
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46	Abbildung	75"	mm
47	Abbildung	75"	mm
48	Abbildung	75"	mm
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67	Abbildung	75"	mm
68	Abbildung	75"	mm
69	Abbildung	75"	mm
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72	Abbildung	75"	mm
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75	Abbildung	75"	mm
76	Abbildung	75"	mm
77	Abbildung	75"	mm
78	Abbildung	75"	mm
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81	Abbildung	75"	mm
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89	Abbildung	75"	mm
90	Abbildung	75"	mm
91	Abbildung	75"	mm
92	Abbildung	75"	mm
93	Abbildung	75"	mm
94	Abbildung	75"	mm
95	Abbildung	75"	mm
96	Abbildung	75"	mm
97	Abbildung	75"	mm
98	Abbildung		

9.2.6 T&T additional stay arms | 150 kg

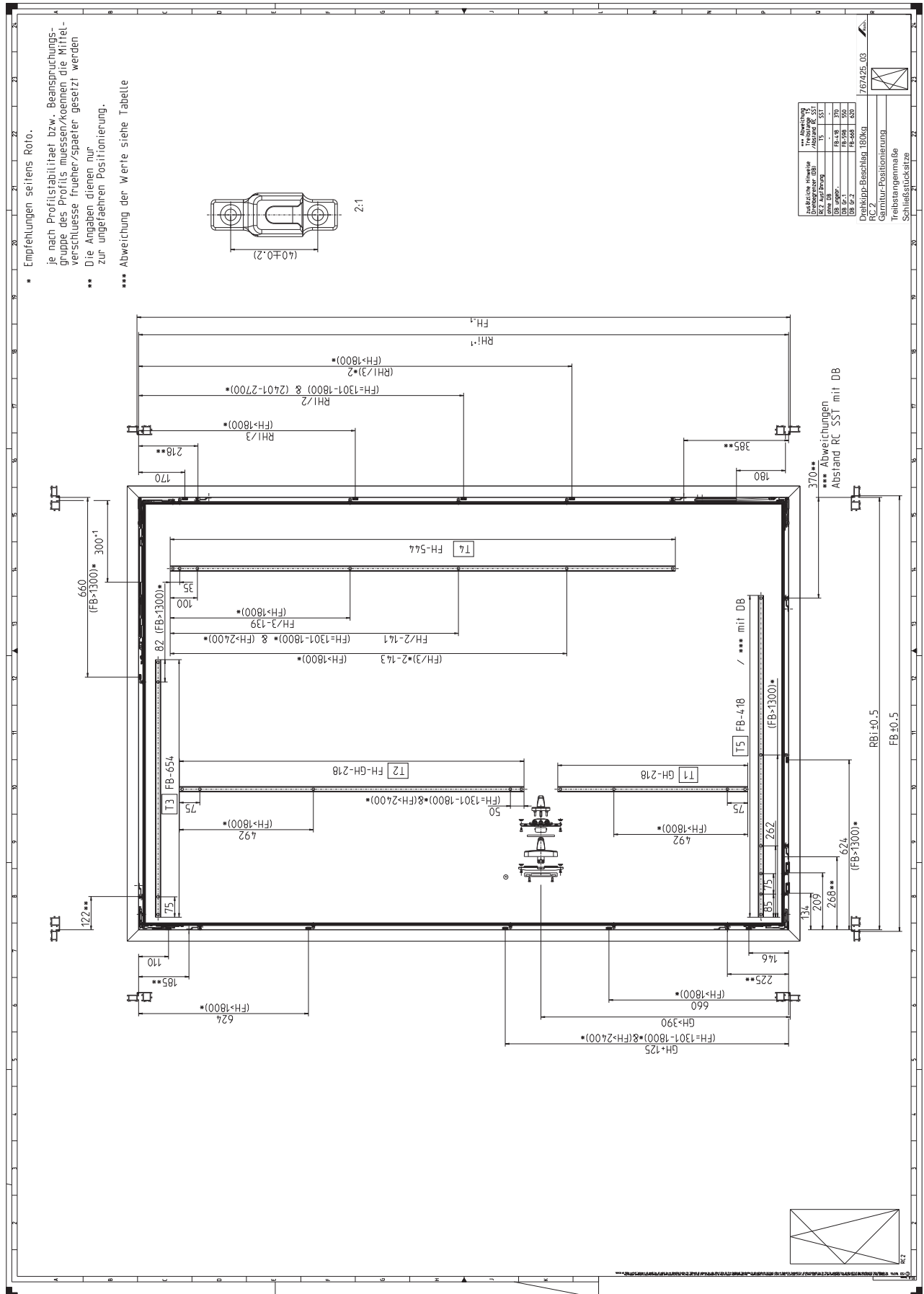




9.2.7 T&T | 180 kg

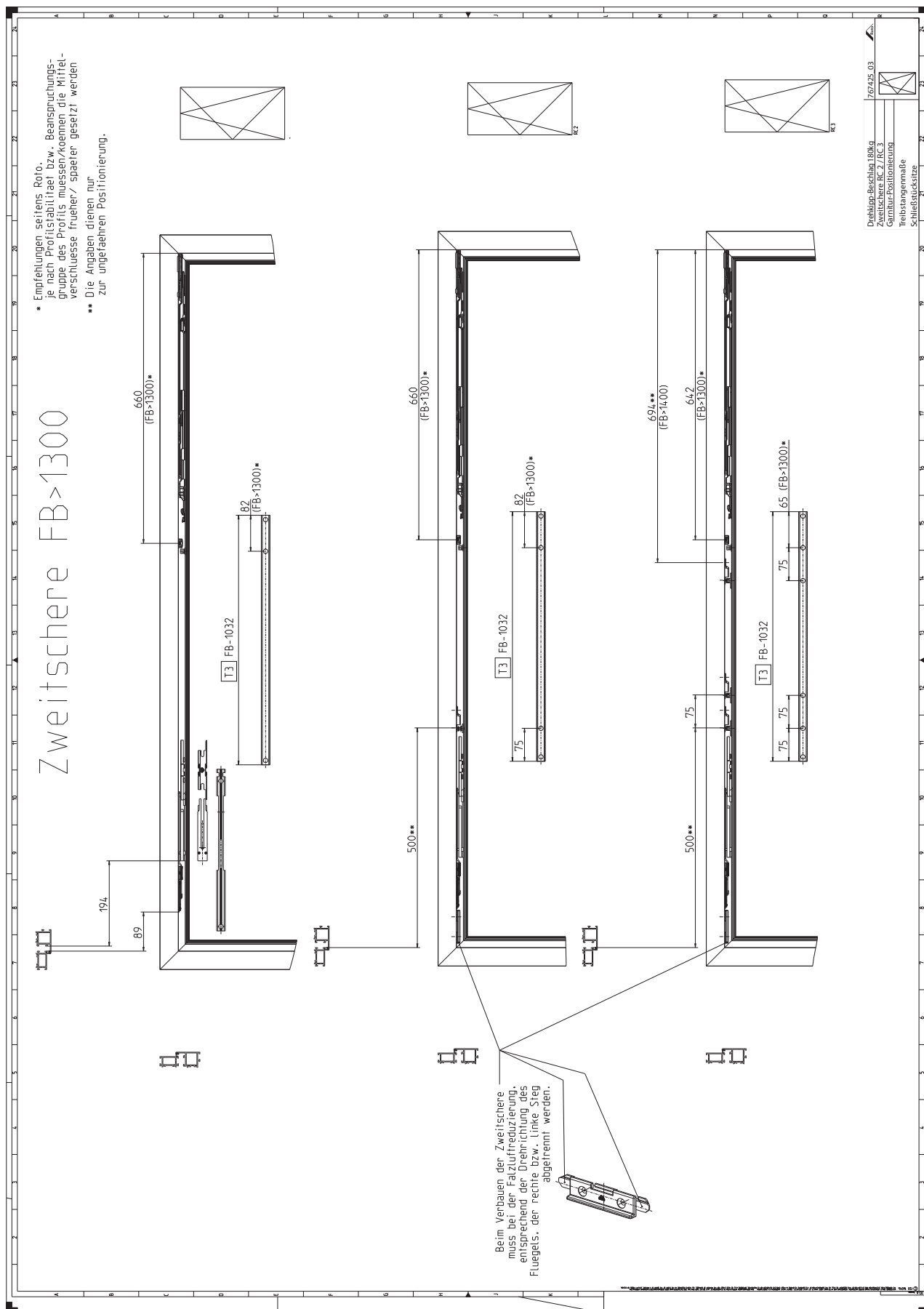


9.2.8 T&T | 180 kg | RC 2



[illegible]

9.2.10 T&T additional stay arms | 180 kg





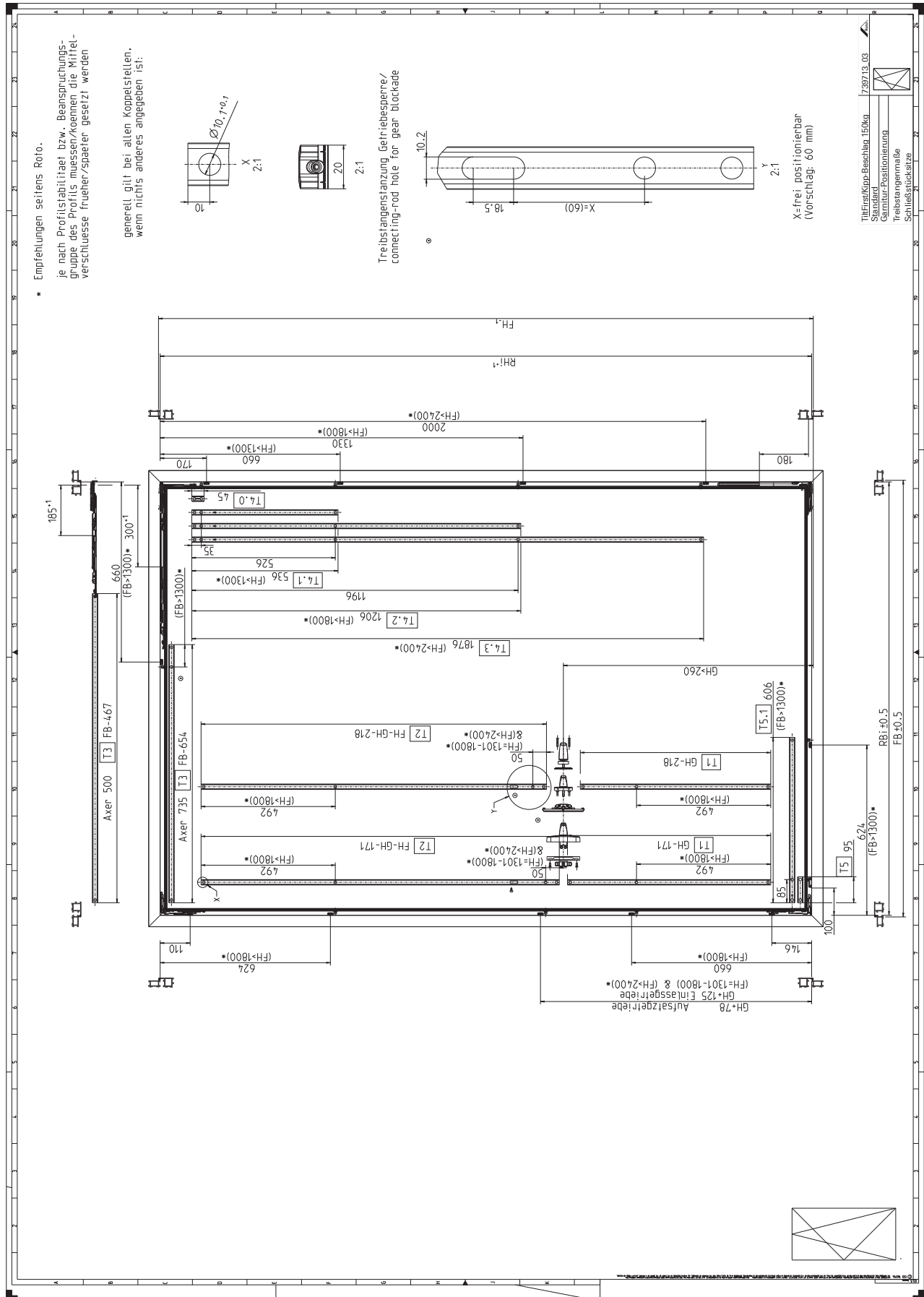
9.3 TiltFirst hardware

9.3.1 Explanation

The following markings are used in the installation drawings to emphasise references and other elements:

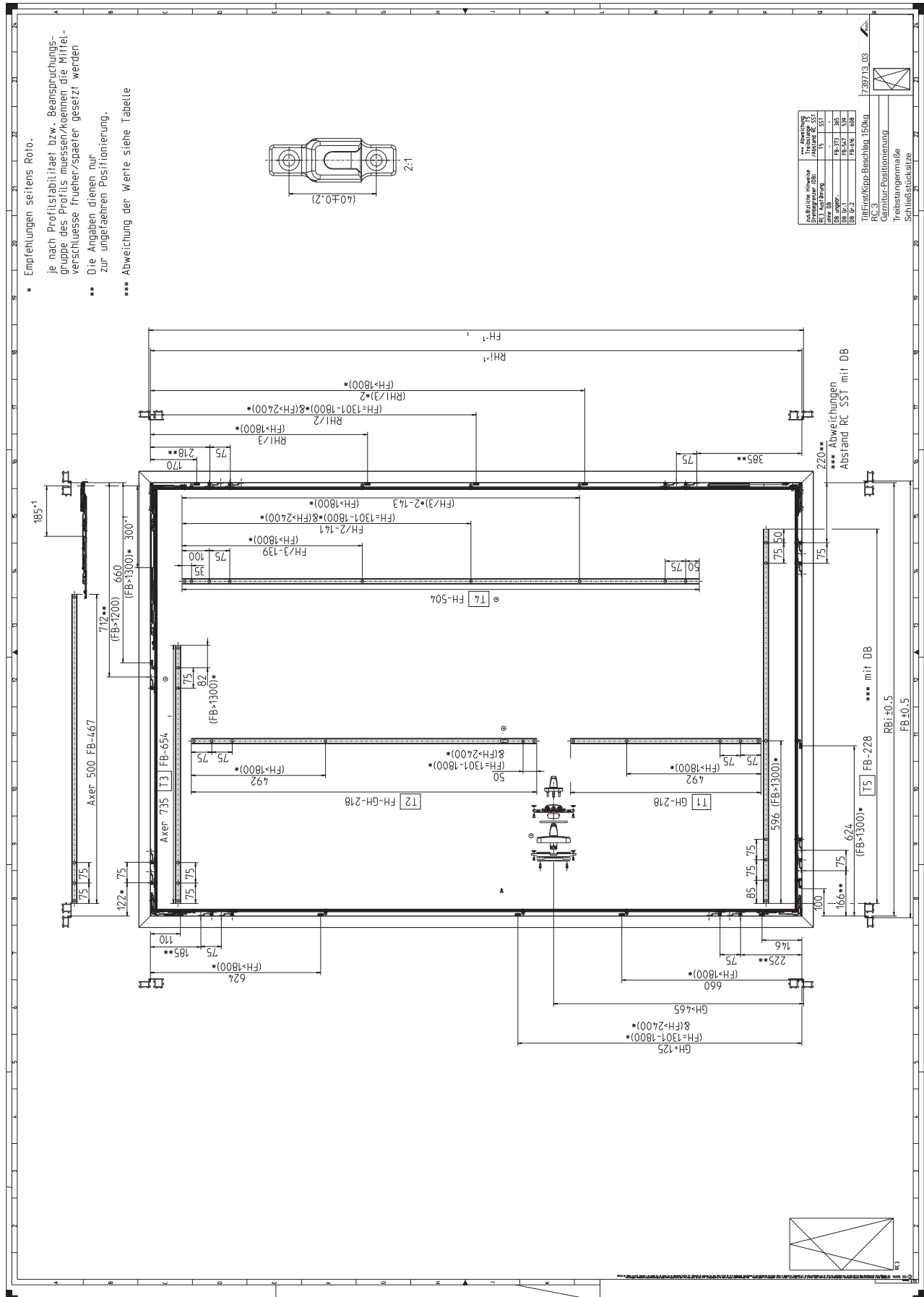
Marking	Translation
Abweichungen Abstand RC SST mit DB	Deviations from distance SEC striker with turn restrictor
Abweichung der Werte siehe Tabelle	Refer to the table for deviations in the values
Abweichung Treibstange T5/Abstand RC SST	Deviation from connecting rod CR5 / distance SEC striker
Aufsatzgetriebe	Geared-handle
Ausführung	Version
Axer	Sash stay
Beim Verbauen der Zweitschere muss bei der Falzluftreduzierung, entsprechend der Drehrichtung des Fluegels, der rechte bzw. linke Steg abgetrennt werden.	When fitting the additional stay arm, the right or left profile leg must be detached for rebate-clearance reduction depending on the direction of rotation of the sash.
DB Gr. ...	Turn restrictor size ...
DB ungebr.	Turn restrictor, unbraked (with stop)
Die Angaben dienen nur zur ungefähren Positionierung.	The information is for approximate positioning only.
Einlassgetriebe	Flush-encased gearbox
Empfehlungen seitens Roto : je nach Profilstabilität bzw. Beanspruchungsgruppe des Profils müssen / können die Mittelverschlüsse früher / später gesetzt werden.	Recommendations from Roto: depending on the profile stability or profile loading group, the centre locks must / can be put in place at an earlier / later point.
FB	Sash width
FH	Sash height
Garnitur-Positionierung	Set positioning
generell bei allen Koppelstellen, wenn nichts anderes angegeben	Generally for all coupling points, unless otherwise specified
GH	Handle height
kg	Kilograms
mit DB	With turn restrictor
ohne DB	Without turn restrictor
RB <i>i</i>	Frame width, internal
RC2	RC 2
RC3	RC 3
RH <i>i</i>	Frame height, internal
Schließstücksitze	Striker positions
SST	Striker
Standard	Standard
T	Connecting rod
TiltFirst/Kipp-Beschlag	TiltFirst hardware / Tilt-Only hardware
Treibstangenstanzung Getriebesperre	Connecting rod punched hole for espagnolette lock
Treibstangenmaße	Connecting rod dimensions
zusätzliche Hinweise Drehbegrenzer (DB)	Additional information on the turn restrictor (TR)
X = frei positionierbar (Vorschlag: 60 mm)	X = freely positionable (suggestion: 60 mm)
Zweitschere	Additional stay arm

9.3.2 TF / TiSs | 150 kg



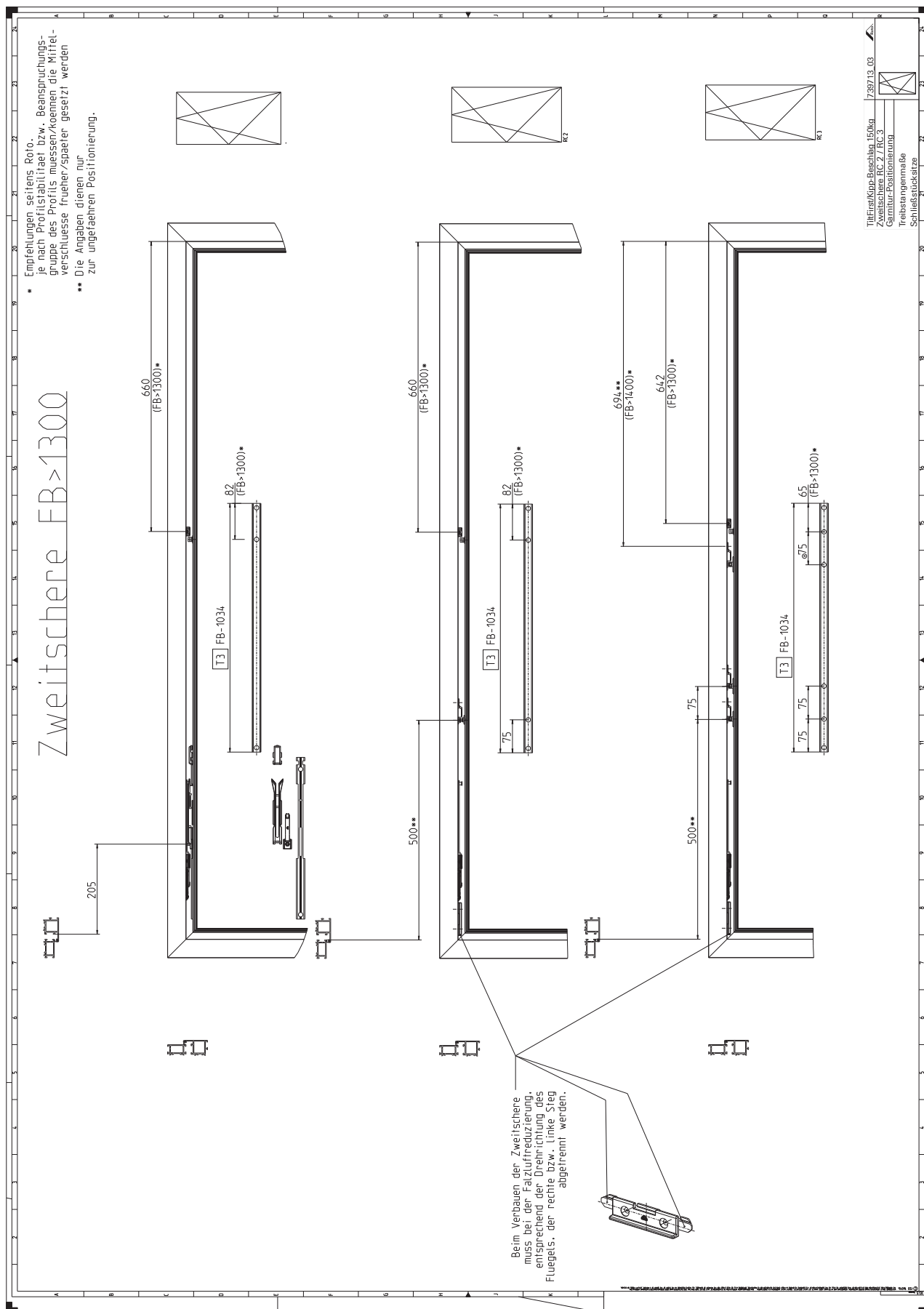
[illegible]

9.3.4 TF / TiSs | 150 kg | RC 3





9.3.5 TF additional stay arms | 150 kg



9.4 Turn-Only hardware

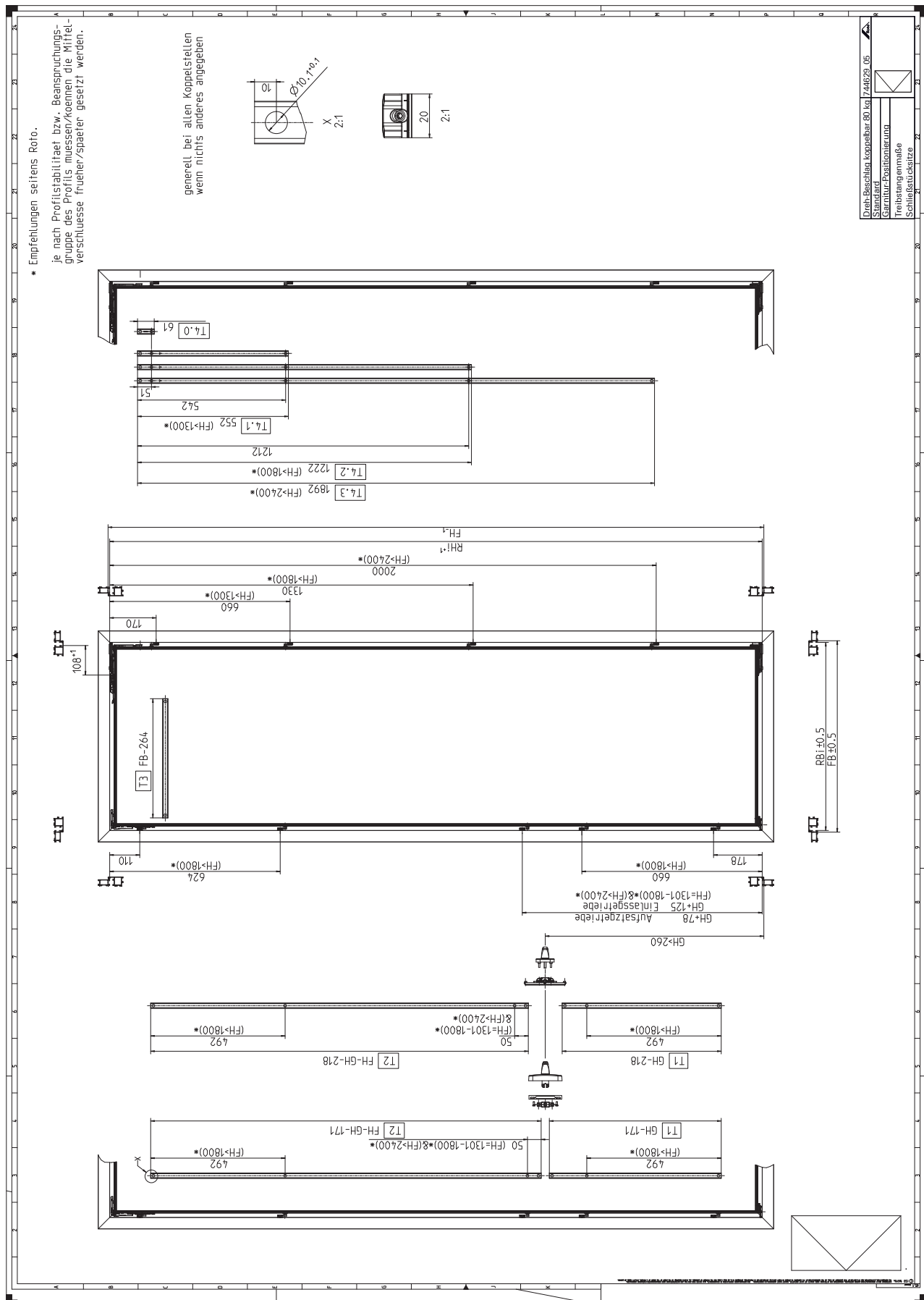
9.4.1 Explanation

The following markings are used in the installation drawings to emphasise references and other elements:

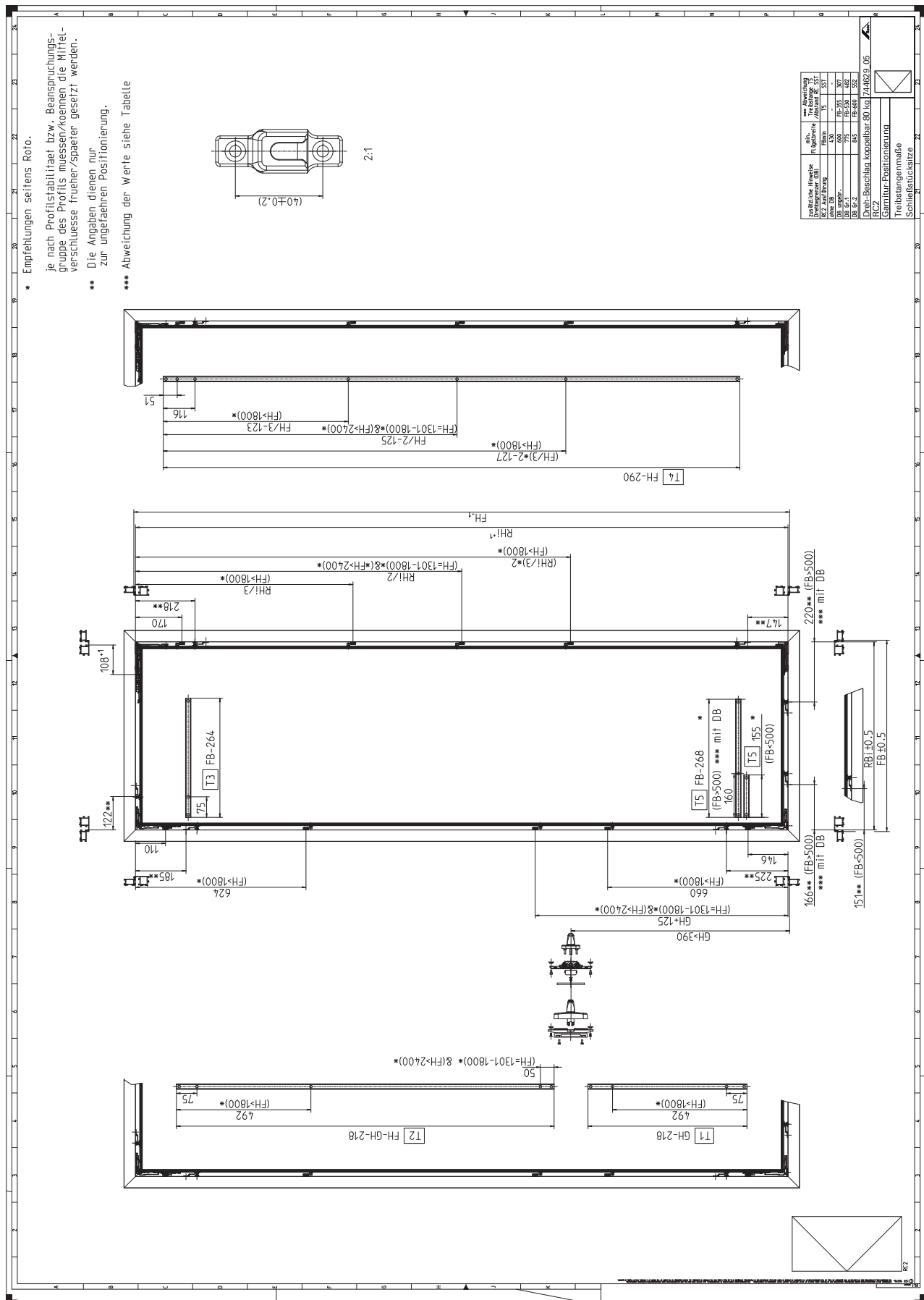
Marking	Translation
Abweichungen Abstand RC SST mit DB	Deviations from distance SEC striker with turn restrictor
Abweichung der Werte siehe Tabelle	Refer to the table for deviations in the values
Abweichung Treibstange T5/Abstand RC SST	Deviation from connecting rod CR5 / distance SEC striker
Aufsatzgetriebe	Geared-handle
Ausführung	Version
DB Gr. ...	Turn restrictor size ...
DB ungebr.	Turn restrictor, unbraked (with stop)
Die Angaben dienen nur zur ungefähren Positionierung.	The information is for approximate positioning only.
Einlassgetriebe	Flush-encased gearbox
Empfehlungen seitens Roto: je nach Profilstabilität bzw. Beanspruchungsgruppe des Profils müssen / können die Mittelverschlüsse früher / später gesetzt werden.	Recommendations from Roto: depending on the profile stability or profile loading group, the centre locks must / can be put in place at an earlier / later point.
FB	Sash width
FB min.	Minimum sash width
FH	Sash height
Garnitur-Positionierung	Set positioning
generell bei allen Koppelstellen, wenn nichts anderes angegeben	Generally for all coupling points, unless otherwise specified
GH	Handle height
kg	Kilograms
mit DB	With turn restrictor
mit Flügelbreite	With sash width
ohne DB	Without turn restrictor
RB <i>i</i>	Frame width, internal
RC2	RC 2
RC3	RC 3
RH <i>i</i>	Frame height, internal
Schließstücksitze	Striker positions
SST	Striker
T	Connecting rod
Treibstangenmaße	Connecting rod dimensions
Treibstangenstanzung Getriebesperre	Connecting rod punched hole for espagnolette lock
zusätzliche Hinweise Drehbegrenzer (DB)	Additional information on the turn restrictor (TR)
X = frei positionierbar (Vorschlag: 60 mm)	X = freely positionable (suggestion: 60 mm)



9.4.2 T-O rebate sash stay, couplable | 80 kg

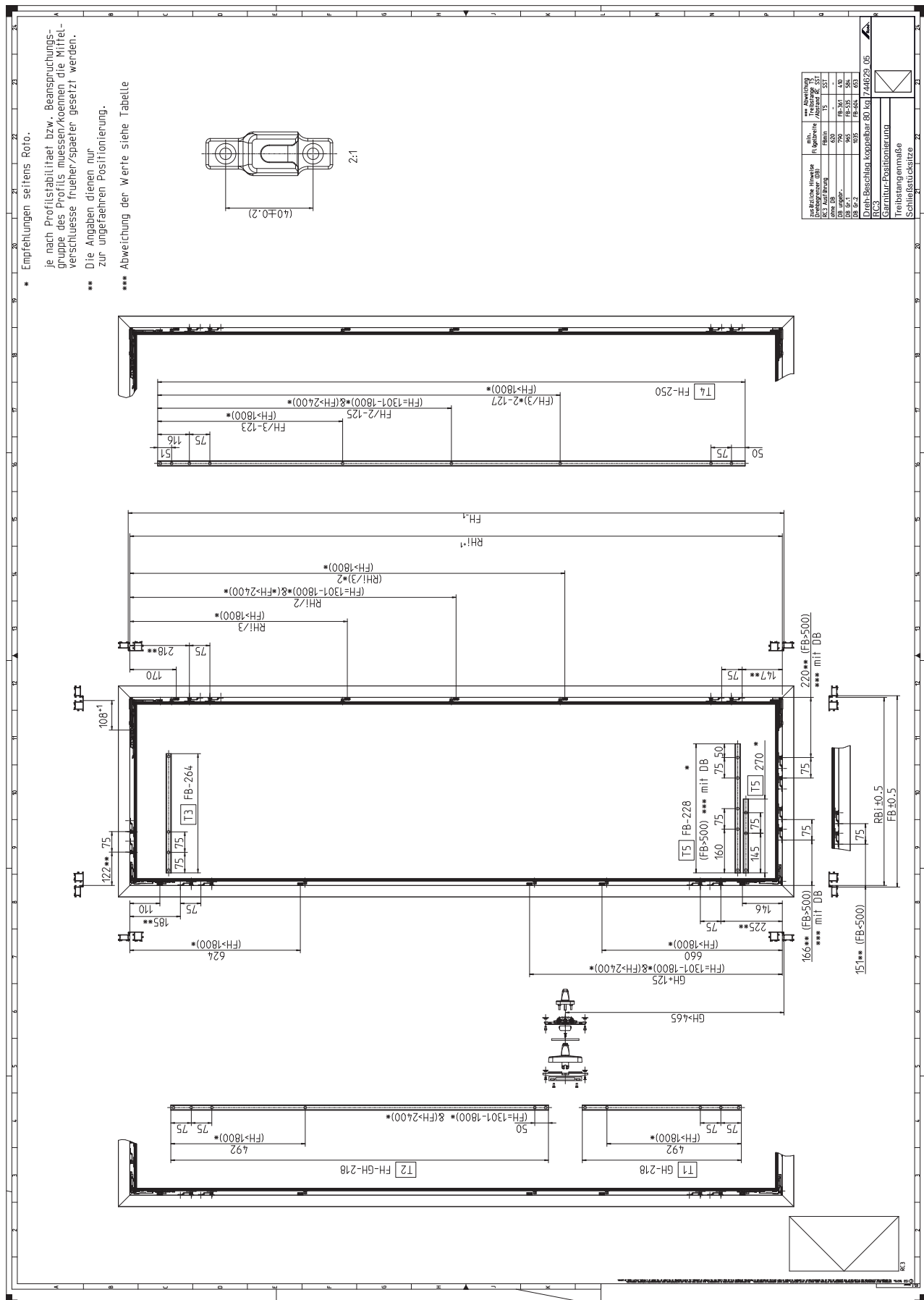


9.4.3 T-O rebate sash stay, couplable | RC 2 | 80 kg

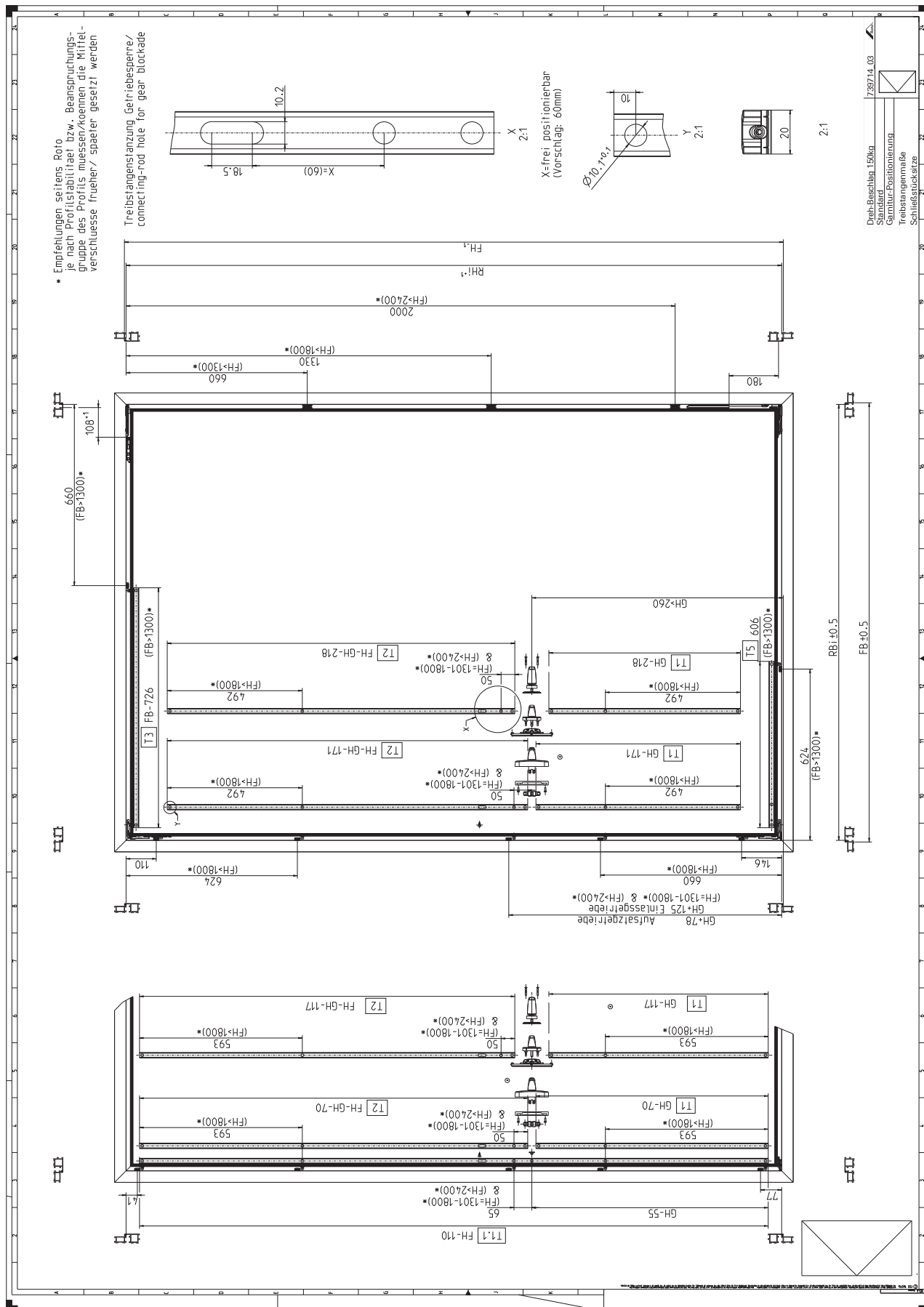




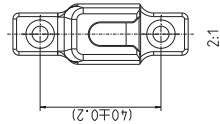
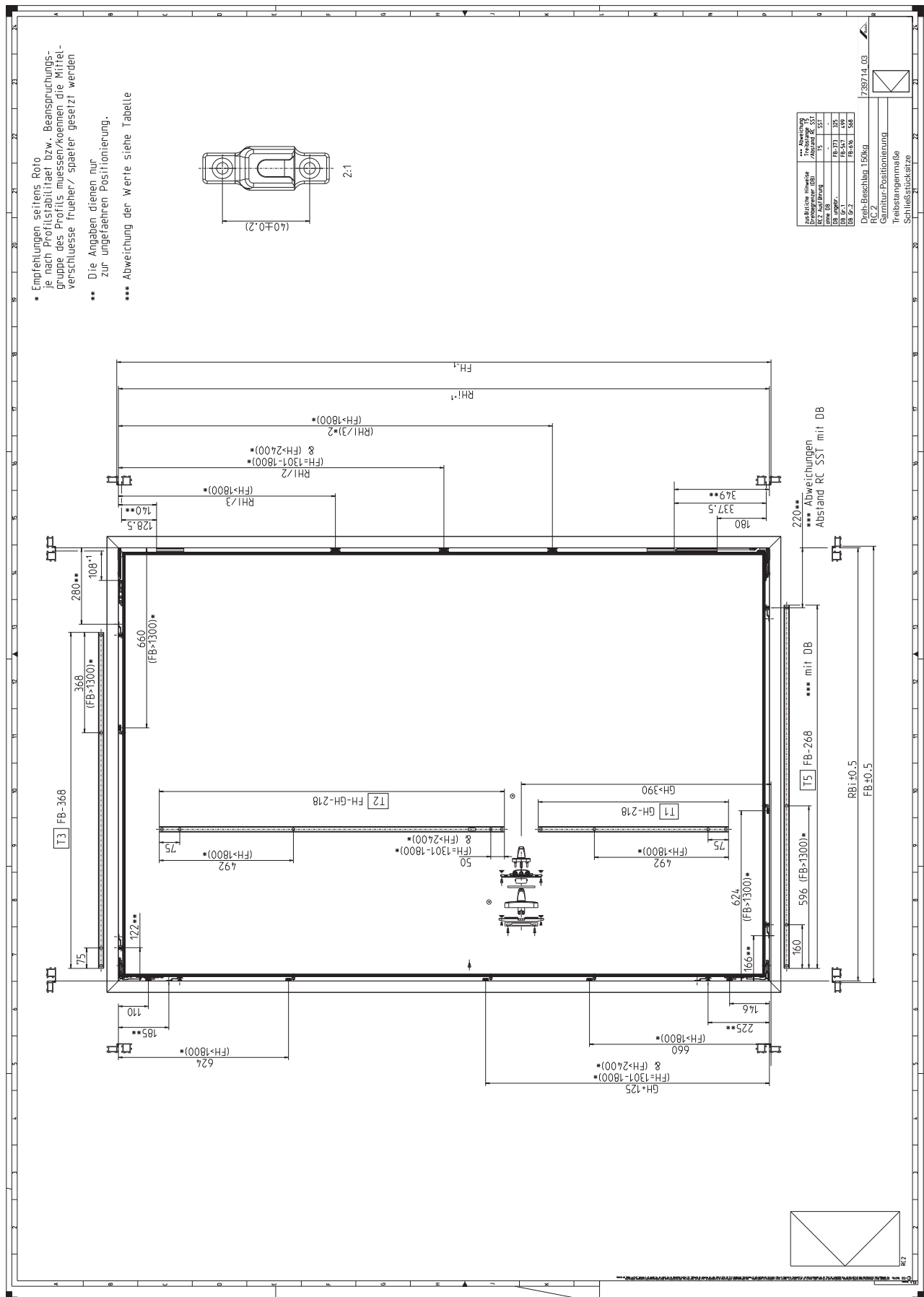
9.4.4 T-O rebate sash stay, couplable | RC 3 | 80 kg



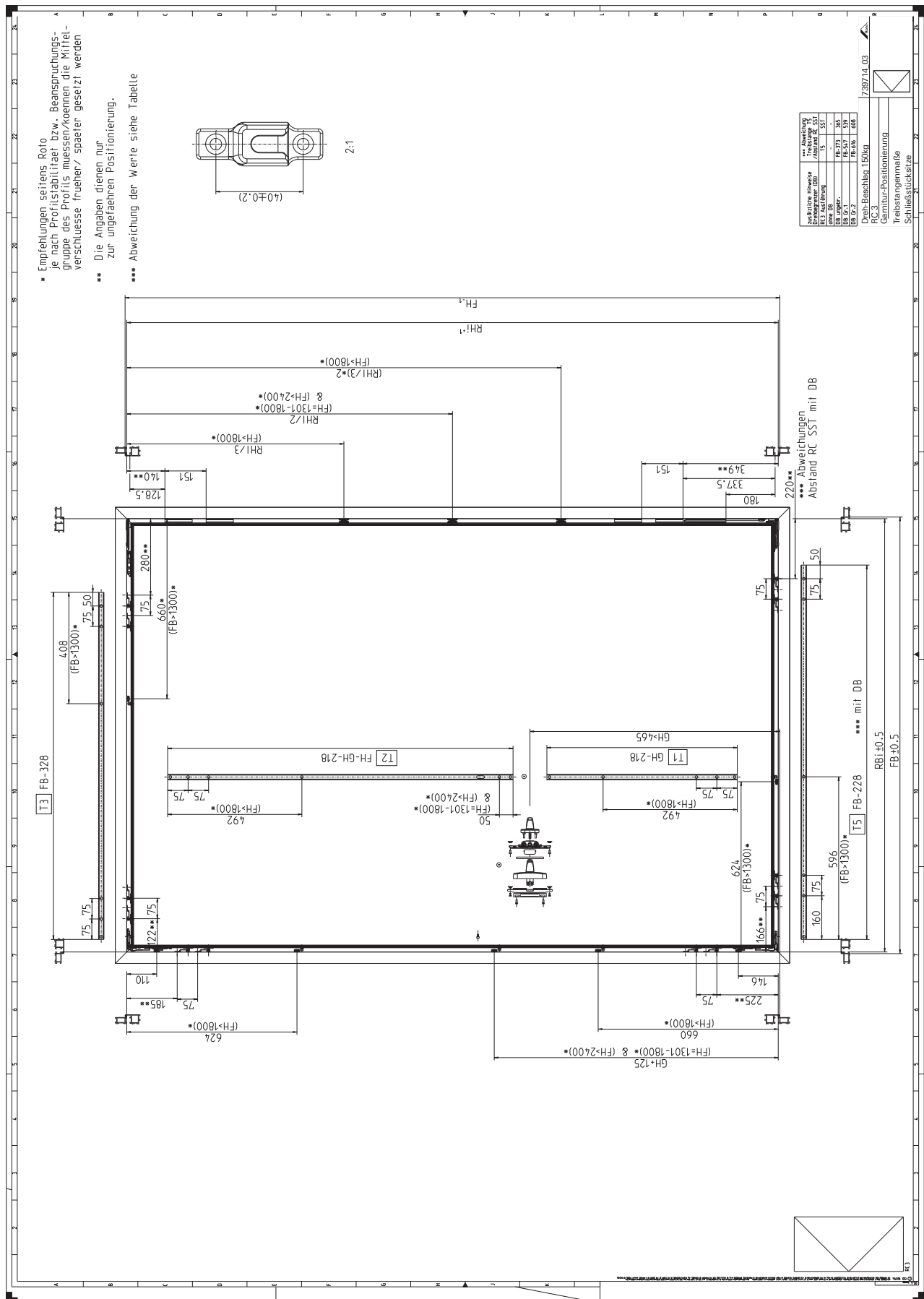
9.4.5 T-O | 150 kg



- * Empfehlungen seitens Roto je nach Profilstabilität bzw. Beanspruchungsgruppe des Profils müssen/können die Mittelverschleüsse früher/ später gesetzt werden
- ** Die Angaben dienen nur zur ungefähren Positionierung.



9.4.7 T-O | 150 kg | RC 3



• Empfehlungen seitens Roto.
je nach Profistabilität bzw. Beanspruchungs-
gruppe des Profils müssen/können die Mittel-
verschlüsse früherer/späterer eingesetzt werden

generell gilt bei allen Koppelstellen
wenn nichts Anderes angegeben ist:

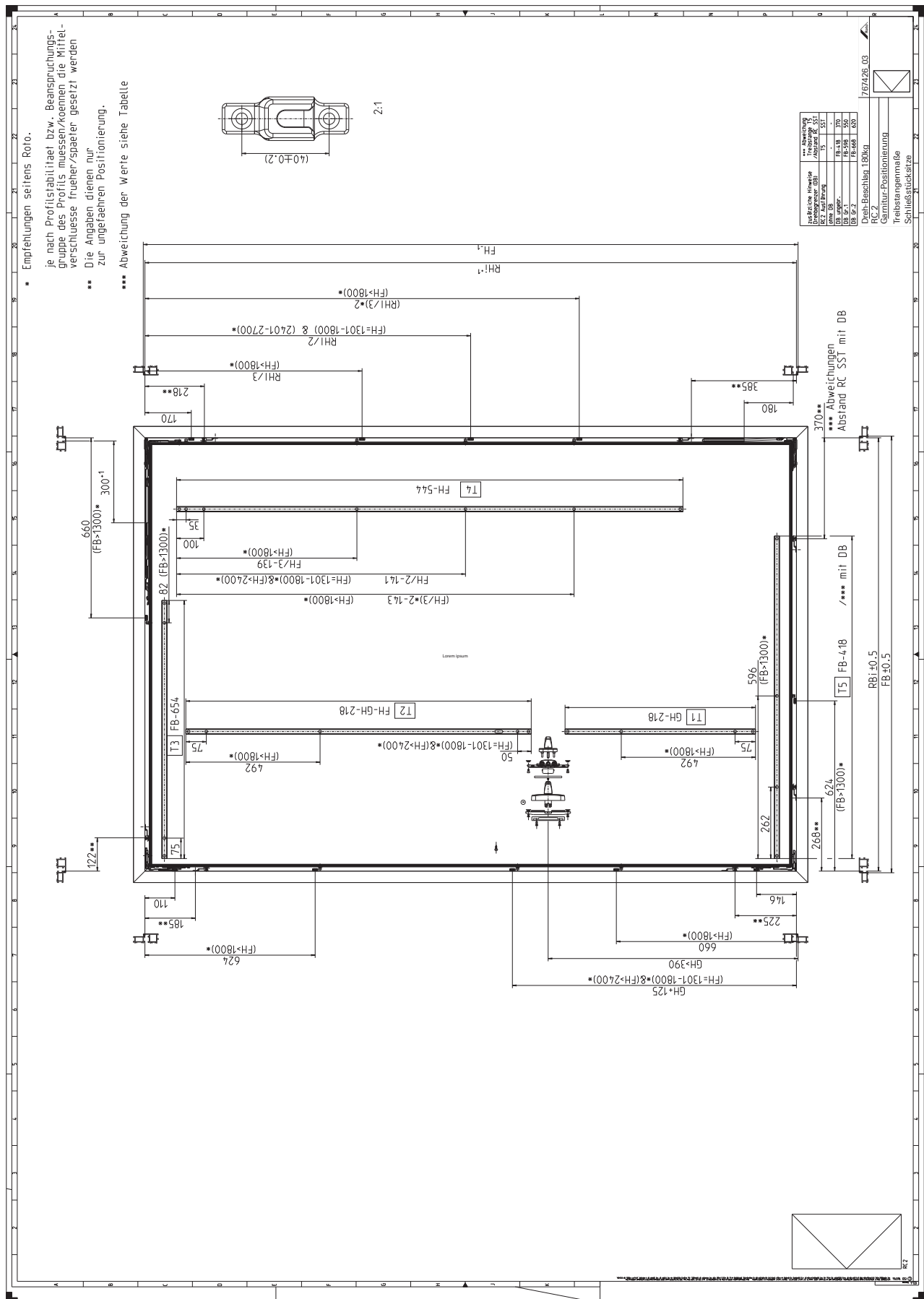
Treibstangenanzug Getriebesperre/
connecting-rod hole for gear blockade

X=frei positionierbar
(Vorschlag: 60mm)

Dreh-Beschlag 180kg
Standard
Garitur-Positionierung
Treibstangenmaße
Schließstückgröße

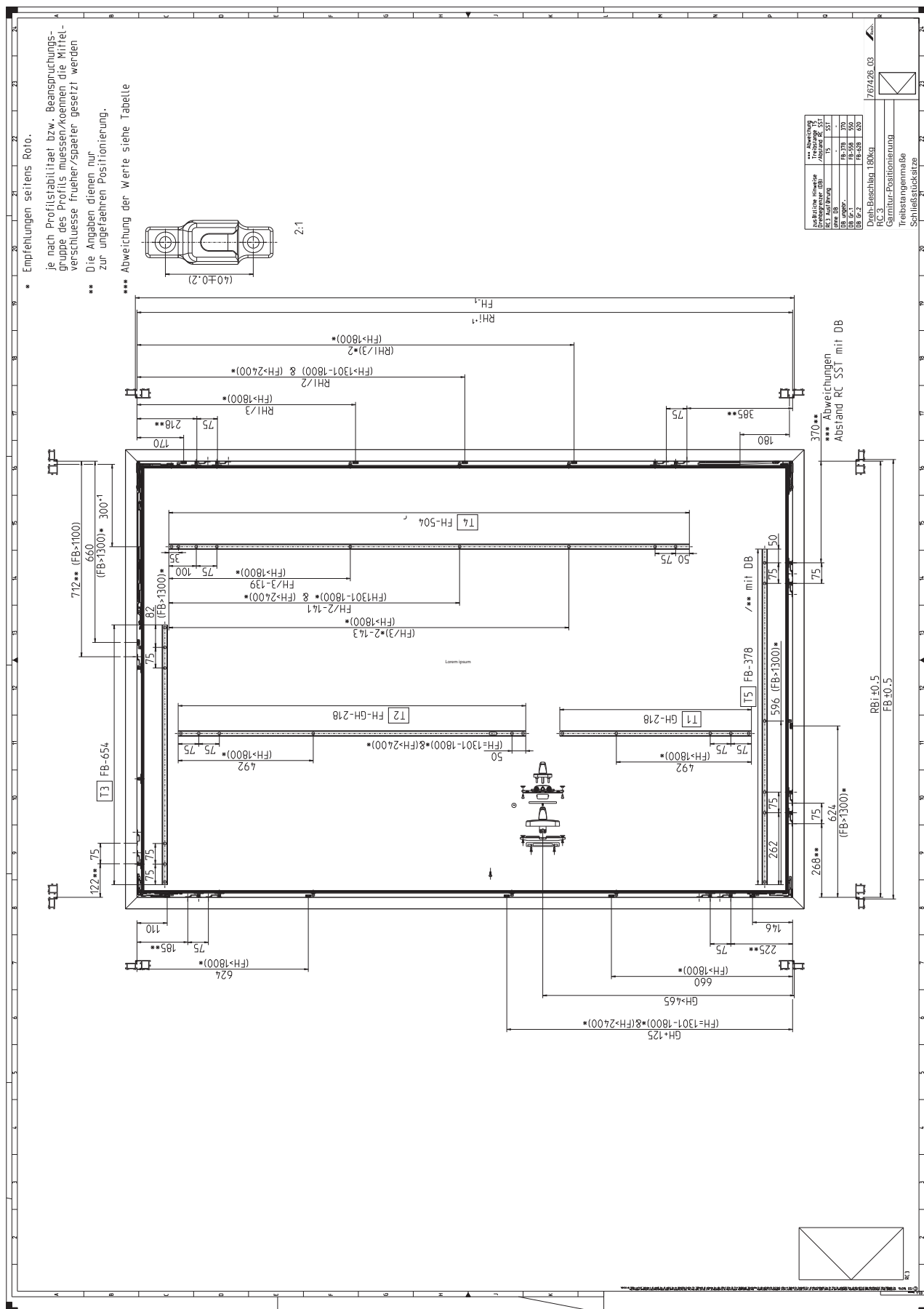
767426_03

9.4.9 T-O | 180 kg | RC 2





9.4.10 T-O | 180 kg | RC 3



9.5 Tilt-Only hardware

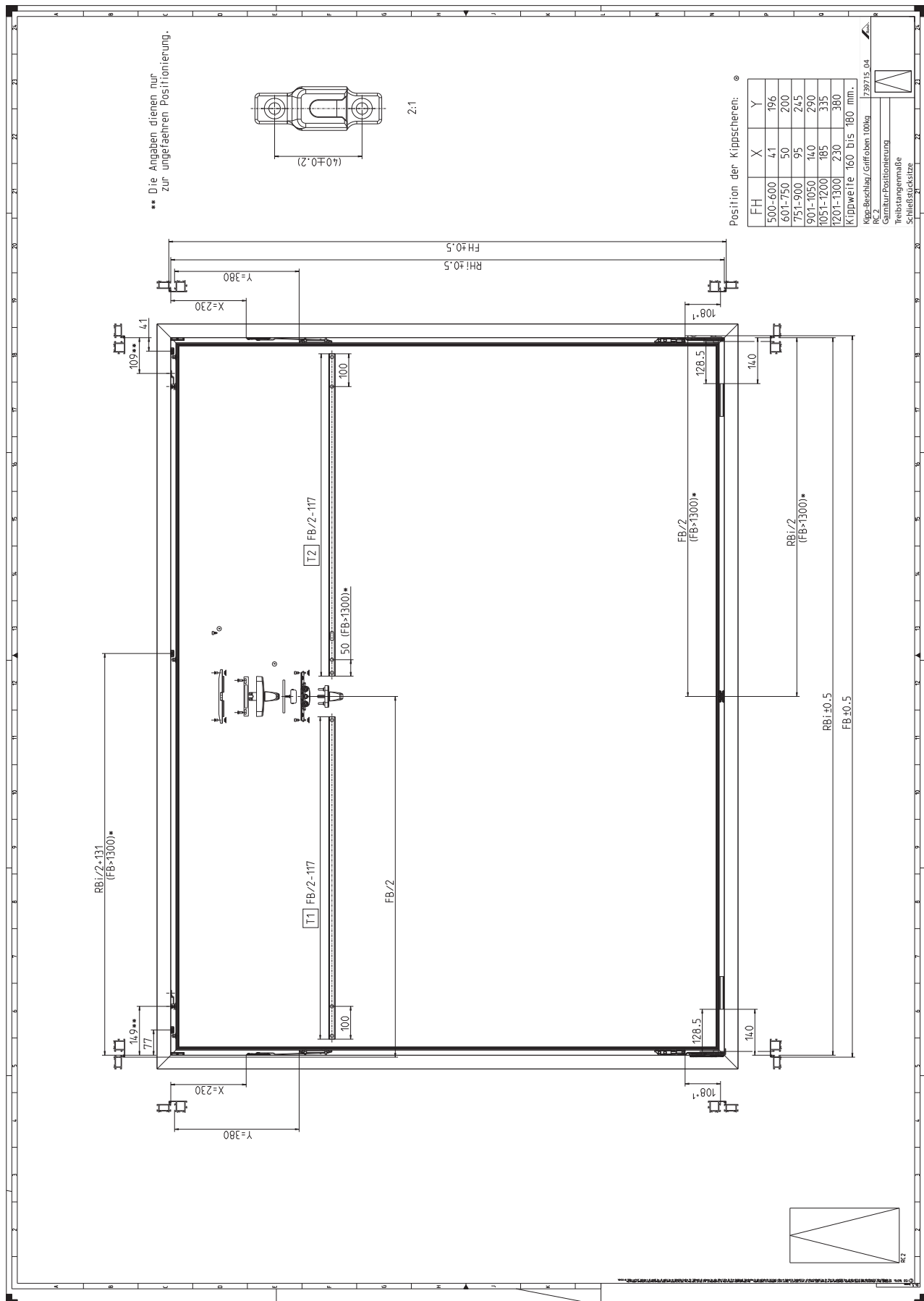
9.5.1 Explanation

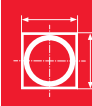
The following markings are used in the installation drawings to emphasise references and other elements:

Marking	Translation
Aufsatzgetriebe	Geared-handle
Axer	Sash stay
Beim Einsatz der Eckumlenkung mit Schaltsperre muss vor der Serienfertigung unbedingt ein Musteranschlag durchgeführt werden, um alle Maße und die Funktion zu prüfen.	When using the corner drive with mishandling device, sample installation is essential before series production starts to check all dimensions and correct functioning.
Die Angaben dienen nur zur ungefähren Positionierung.	The information is for approximate positioning only.
DK Spaltlüfter ohne Zweitschere	Tilt&Turn night vent without additional stay arm
Einlassgetriebe	Flush-encased gearbox
Empfehlungen seitens Roto: je nach Profilstabilität bzw. Beanspruchungsgruppe des Profils müssen / können die Mittelverschlüsse in kürzeren / längeren Abständen gesetzt werden.	Recommendations from Roto: depending on the profile stability or profile loading group, the centre locks must / can be spaced closer together / further apart.
FB	Sash width
FH	Sash height
Garnitur-Positionierung	Set positioning
Generell bei allen Koppelstellen, wenn nichts anderes angegeben	Generally for all coupling points, unless otherwise specified
kg	Kilograms
Kipp-Beschlag/Griff oben	Tilt-Only hardware / handle at the top
Kippweite ... bis ... mm	Tilt distance ... to ... mm
Mitgeltende Unterlagen für die Montage beachten!	Comply with the other applicable documents for installation.
Position der Kippscheren	Position of the Tilt-Only stay arms
RB <i>i</i>	Frame width, internal
RC2	RC 2
RC3	RC 3
RH <i>i</i>	Frame height, internal
Schließstücksitze	Striker positions
T	Connecting rod
Treibstangenmaße	Connecting rod dimensions
Treibstangenstanzung Getriebe ­ sperre	Connecting rod punched hole for espagnolette lock
X = frei positionierbar (Vorschlag: 60 mm)	X = freely positionable (suggestion: 60 mm)

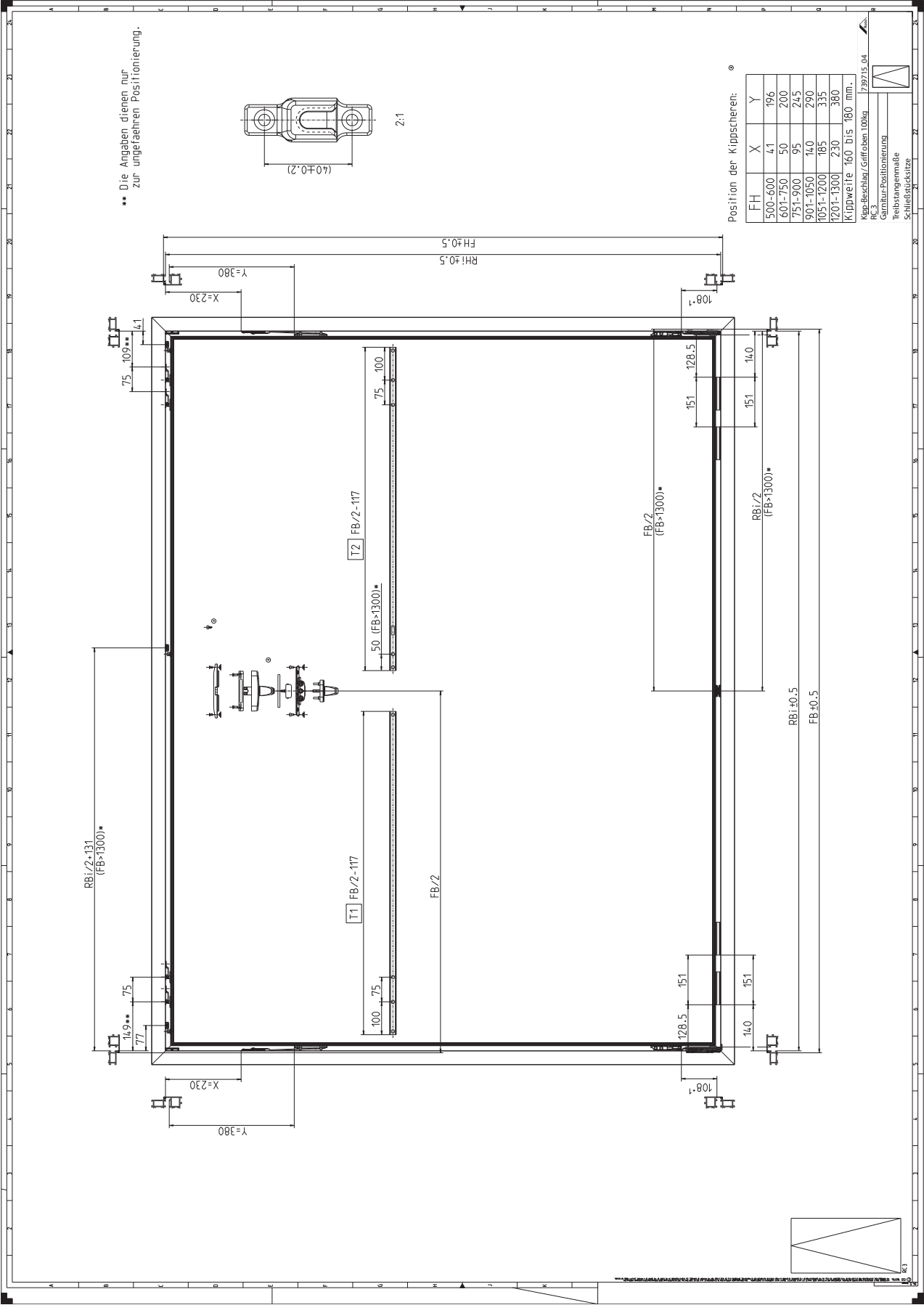
[illegible]

9.5.3 TiSt | 100 kg | RC 2

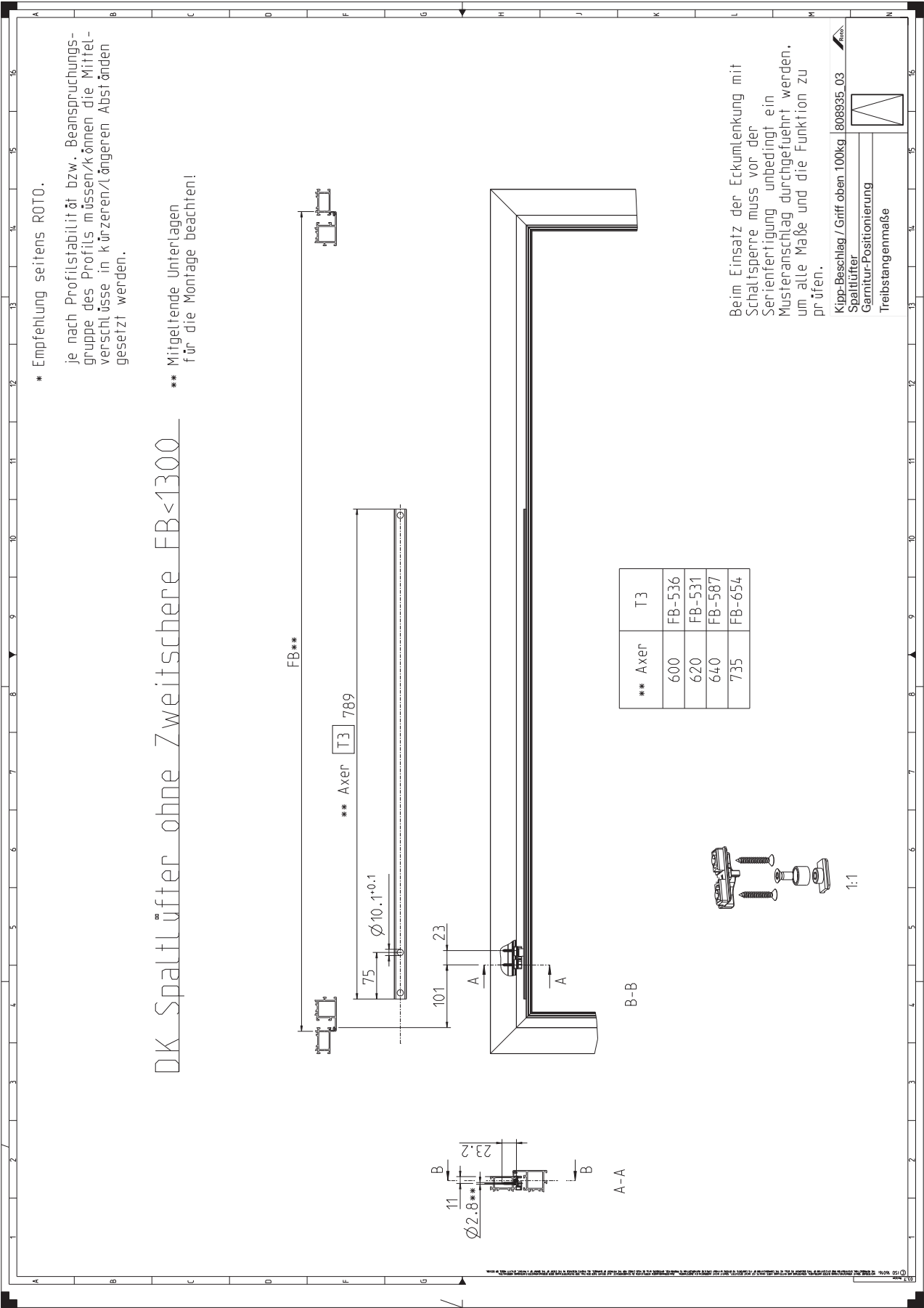




9.5.4 TiSt | 100 kg | RC 3



9.5.5 TiSt night vent





9.6 Floating-mullion hardware

9.6.1 Explanation

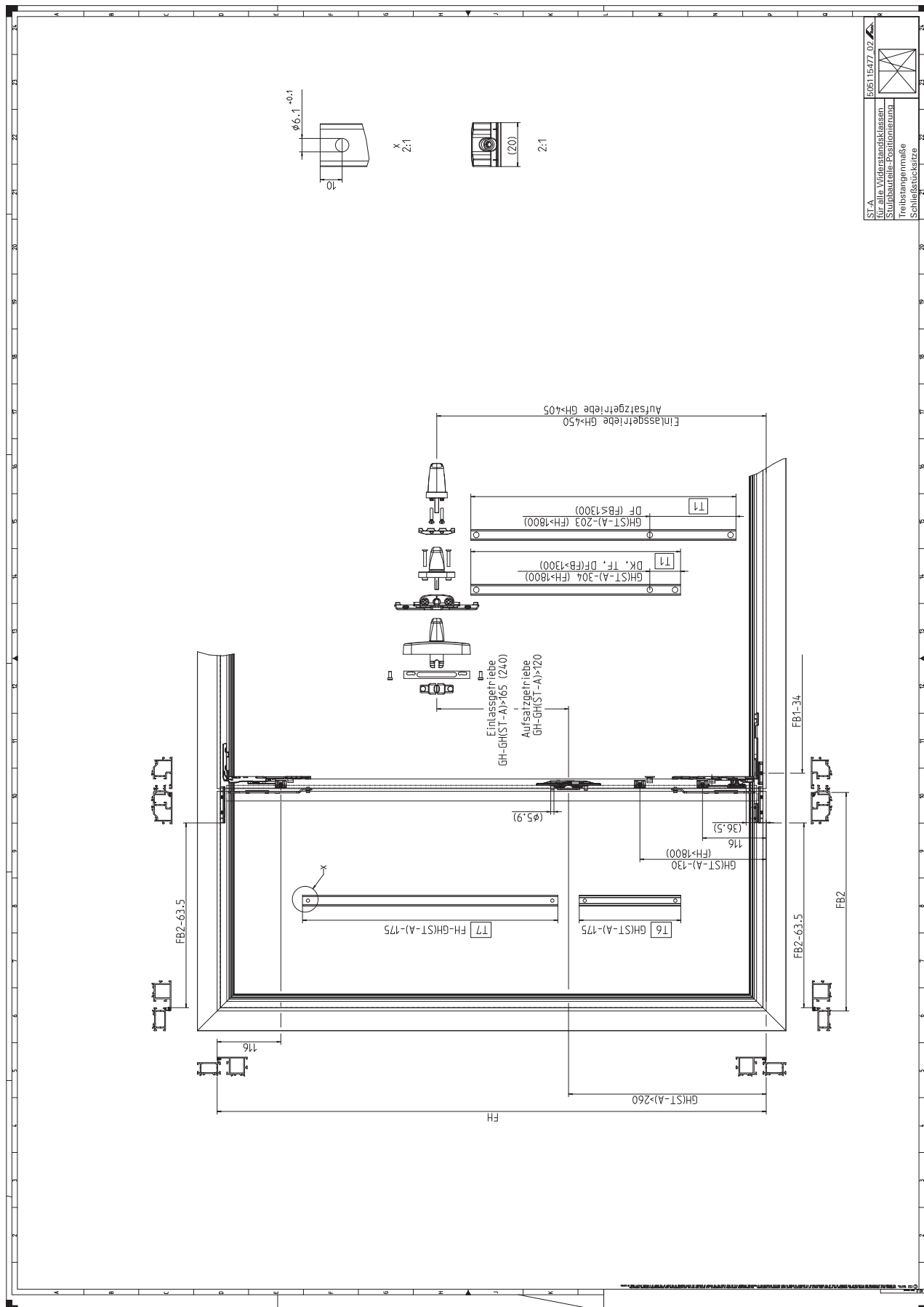
The following markings are used in the installation drawings to emphasise references and other elements:

Marking	Translation
Abweichungen Abstand RC SST mit DB	Deviations from distance SEC striker with turn restrictor
Abweichung der Werte siehe Tabelle	Refer to the table for deviations in the values
Abweichung Treibstange T5/Abstand RC SST	Deviation from connecting rod CR5 / distance SEC striker
AL und AL Desingo	Roto AL and Roto AL Designo
Aufsatzgetriebe	Geared-handle
Ausführung	Version
Axer	Sash stay
Darstellung Schließpunkt	Locking point diagram
DB Gr. ...	Turn restrictor size ...
DB ungebr.	Turn restrictor, unbraked (with stop)
DF	Turn-Only hardware
Die Angaben dienen nur zur ungefähren Positionierung.	The information is for approximate positioning only.
Dreh-Beschlag	Turn-Only hardware
Dreh-Beschlag koppelbar	Turn-Only hardware, couplable
Dreh(Zweitöffnender Flügel) - Dreh-Kipp(Erstöffnender Flügel)	Turn-Only (second opening sash) – Tilt&Turn (first opening sash)
Einbaurichtung beachten. Pfeil zeigt zum Überschlag.	Note the installation direction. The arrow points to the overlap.
Einlassgetriebe	Flush-encased gearbox
Empfehlungen seitens Roto : je nach Profilstabilität bzw. Beanspruchungsgruppe des Profils müssen / können die Mittelverschlüsse früher / später gesetzt werden.	Recommendations from Roto: depending on the profile stability or profile loading group, the centre locks must / can be put in place at an earlier / later point.
Ergänzende Unterlagen: Einbauzeichnung ST	Additional documents: floating-mullion espagnolette installation drawing
FB	Sash width
FH	Sash height
Garnitur-Positionierung	Set positioning
Generell bei Stulp Koppelstellen, wenn nichts anderes angegeben	Generally for floating mullion coupling points, unless otherwise specified
Gezeichnet in Drehstellung.	Drawn in the turn position.
GH	Handle height
Hinweis: Position und Orientierung der Schliessstücke beim Passivflügel abweichend zum Standard.	Note: the position and orientation of the strikers on the second opening sash differ from the standard position and orientation.
Hinweis: Schließstücke (für T1 und T2) auf Stulpprofil sind vom Flügelüberschlag bemaßt.	Note: strikers (for CR1 and CR2) on the floating-mullion profile are dimensioned from the sash overlap.
in verriegeltem Zustand arretieren	Stop when locked
kg	Kilograms
Laenge der Treibstangen nach Bedarf anpassen	Adapt the length of the connecting rods as required
min	Minimum
mit DB	With turn restrictor
Mitgeltende Unterlagen für die Montage beachten!	Comply with the other applicable documents for installation.
Öffnungsarten	Opening types
RBi	Frame width, internal
RC2	RC 2
RC3	RC 3
RHi	Frame height, internal
Schalthebel gefräst	Operating lever, routed
Schliessbewegung der Treibstange	Connecting rod closing movement
Schliesser	Cam
Schließstück	Striker
Schließstueck 660 mm ab FH>1800 mm unbedingt beachten.	Imperatively note striker 660 mm from SH > 1800 mm.
Schließstücksitze	Striker positions
SH-Schliesser	Security cam
SH-Schließstück	Security striker
SH-Verriegelung	Security locking
SH-Verriegelung-Positionierung	Positioning of the security locking
SST	Striker
ST	Floating-mullion espagnolette, internal

Marking	Translation
Standard	Standard
ST-A	Floating-mullion espagnolette, surface-mounted
ST-AS	Floating-mullion espagnolette, surface-mounted, narrow version
ST-K	Floating-mullion shootbolt
ST-R	Floating-mullion espagnolette, slider
ST koppelbar	Floating-mullion hardware, couplable
ST und ST barrierefrei	Floating-mullion espagnolette, internal, not accessible / accessible
Stulpbauteile-Positionierung	Floating-mullion component positioning
Stulp-Beschlag	Floating-mullion hardware
Stulp DIN L	Floating-mullion hardware, DIN left
Stulpfluegelgetriebe	Floating-mullion espagnolette
T	Connecting rod
Treibstangenmaße	Connecting rod dimensions
zusätzliche Hinweise Drehbegrenzer (DB)	Additional information on the turn restrictor (TR)
Y-Wert ist in dem vorgegebenen Bereich ($0 < y < 63$) frei wählbar.	The Y-value can be freely selected in the specified range ($0 < y < 63$).

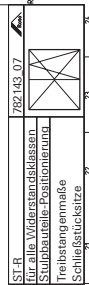
[illegible]

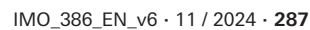
9.6.3 FM-Su



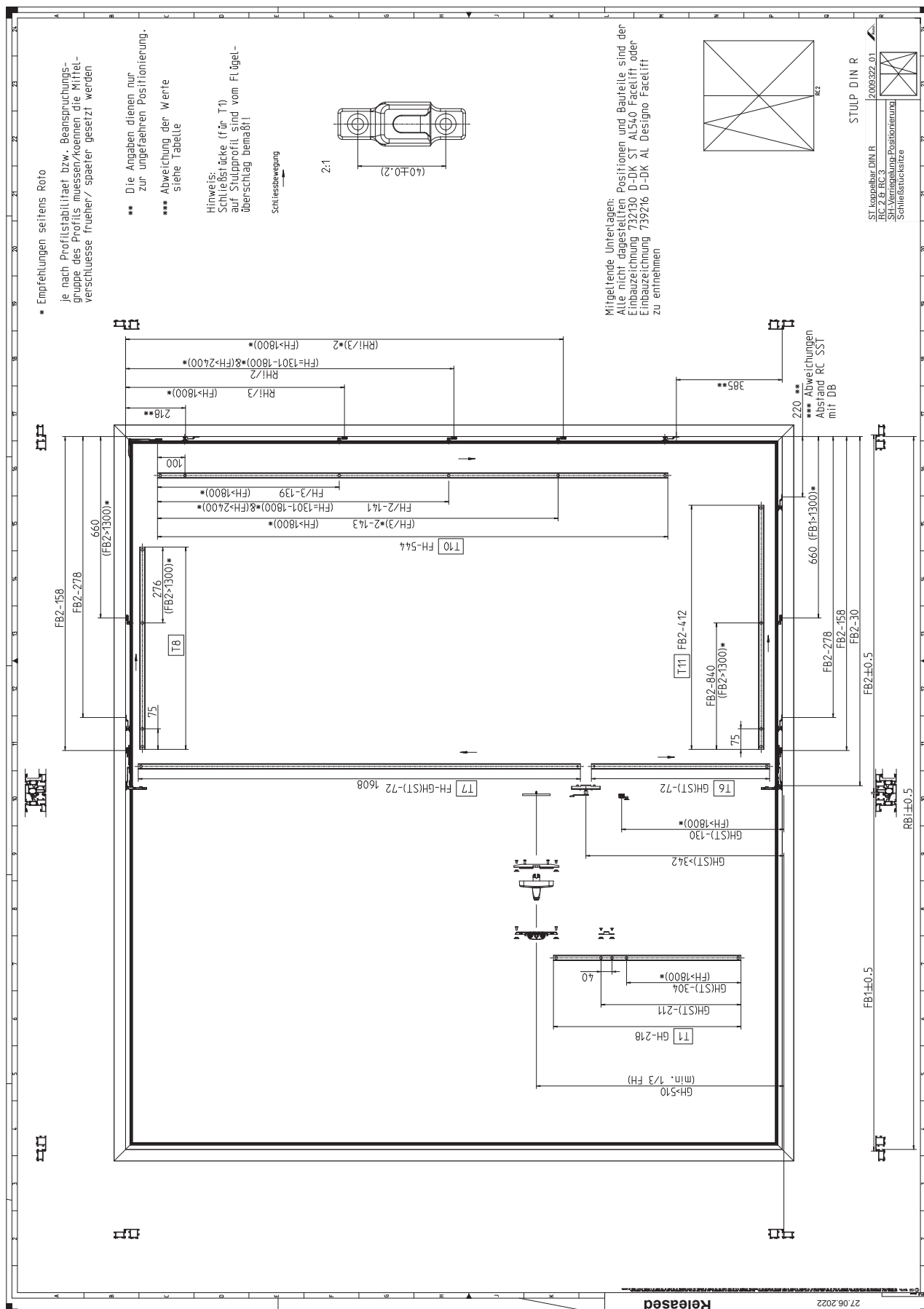
[illegible]

9.6.5 FM-R



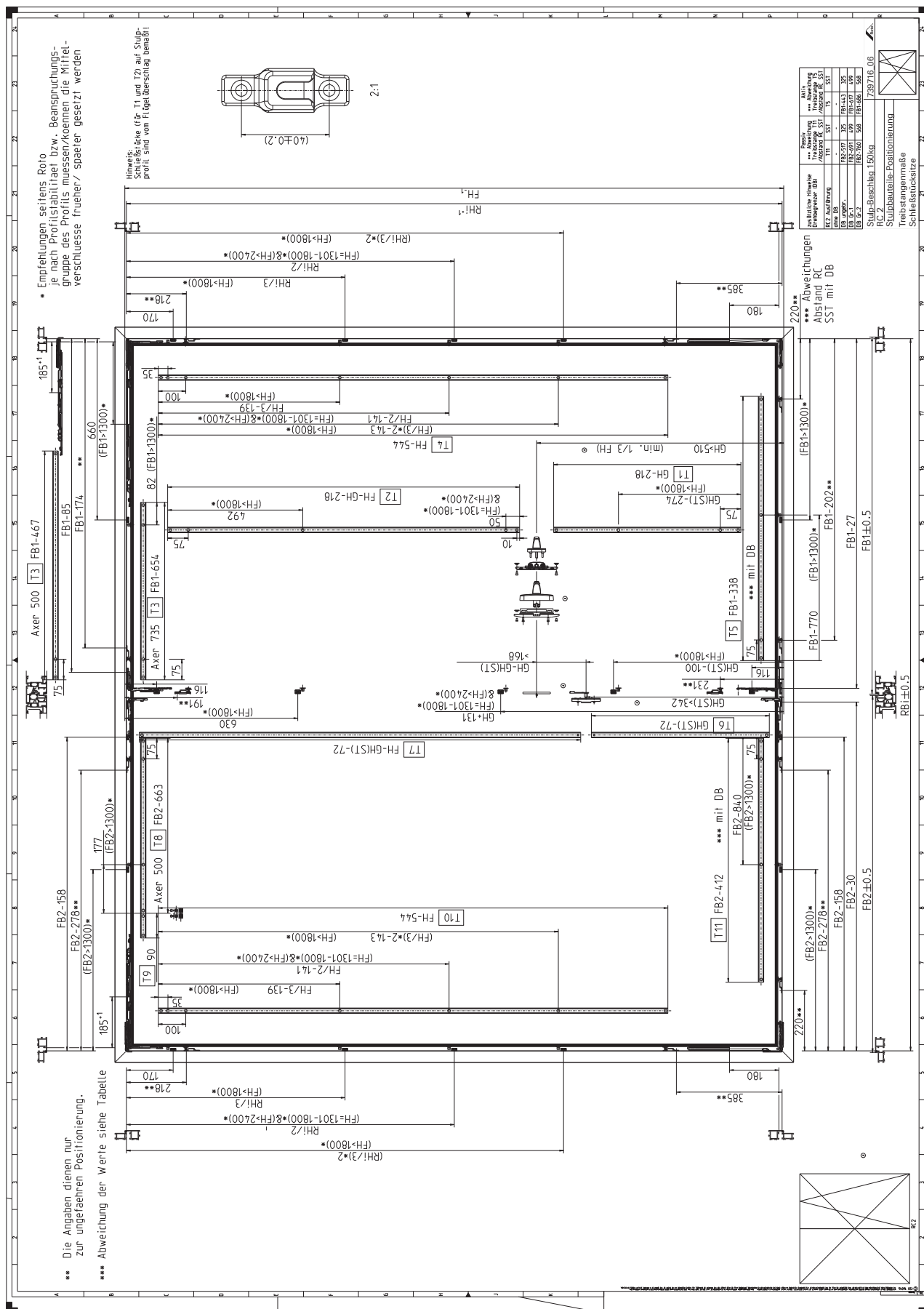


9.6.7 FM, couplable | SEC locking | RC 2 / RC 3 | DIN R



Hinweis: Schließkräfte (für T1 und T2) auf Stulpprofil sind vom Flügelüberschlag bemessen!

9.6.9 FM, couplable | 150 kg | RC 2



[illegible]

9.7 Accessories

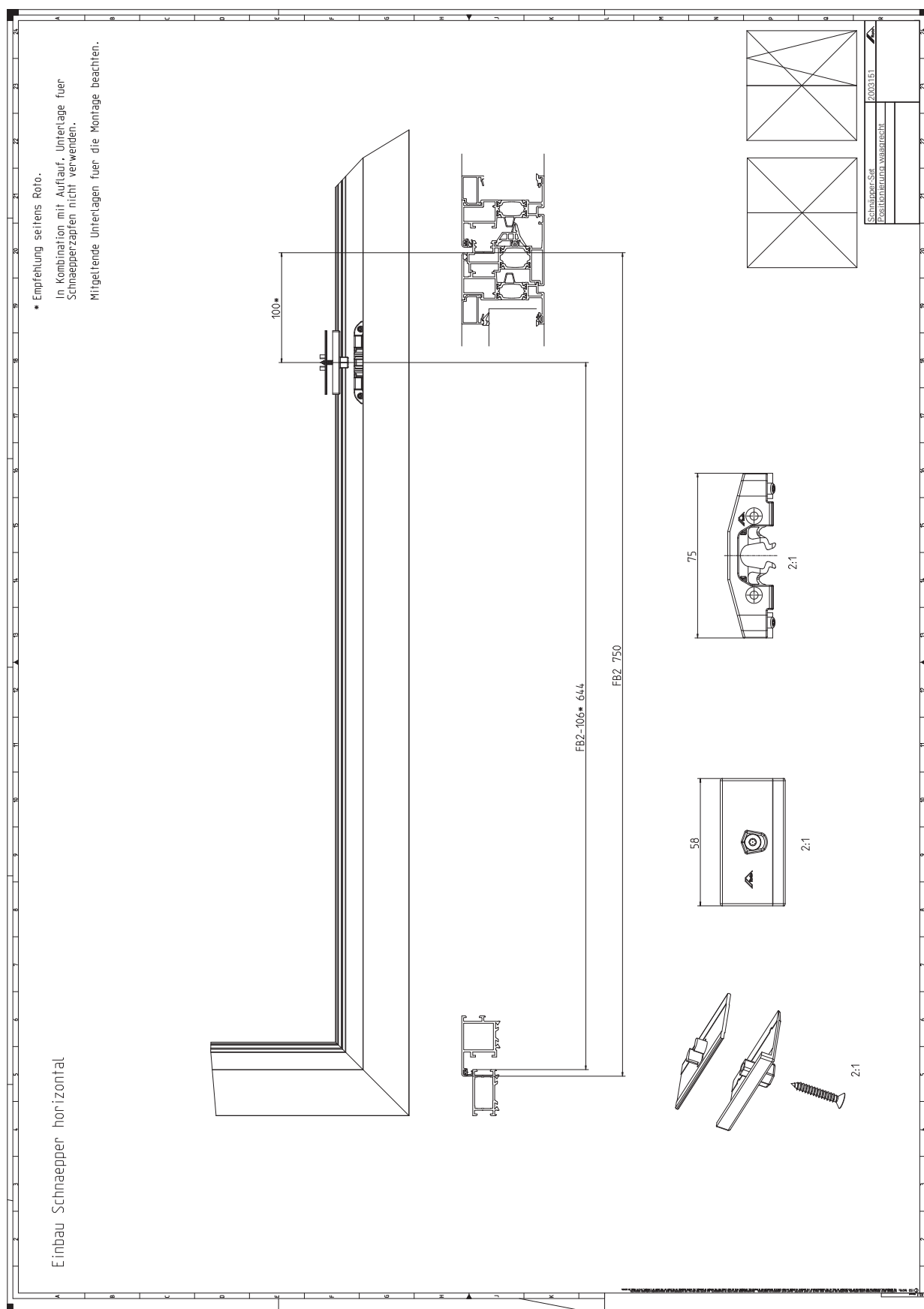
9.7.1 Explanation

The following markings are used in the installation drawings to emphasise references and other elements:

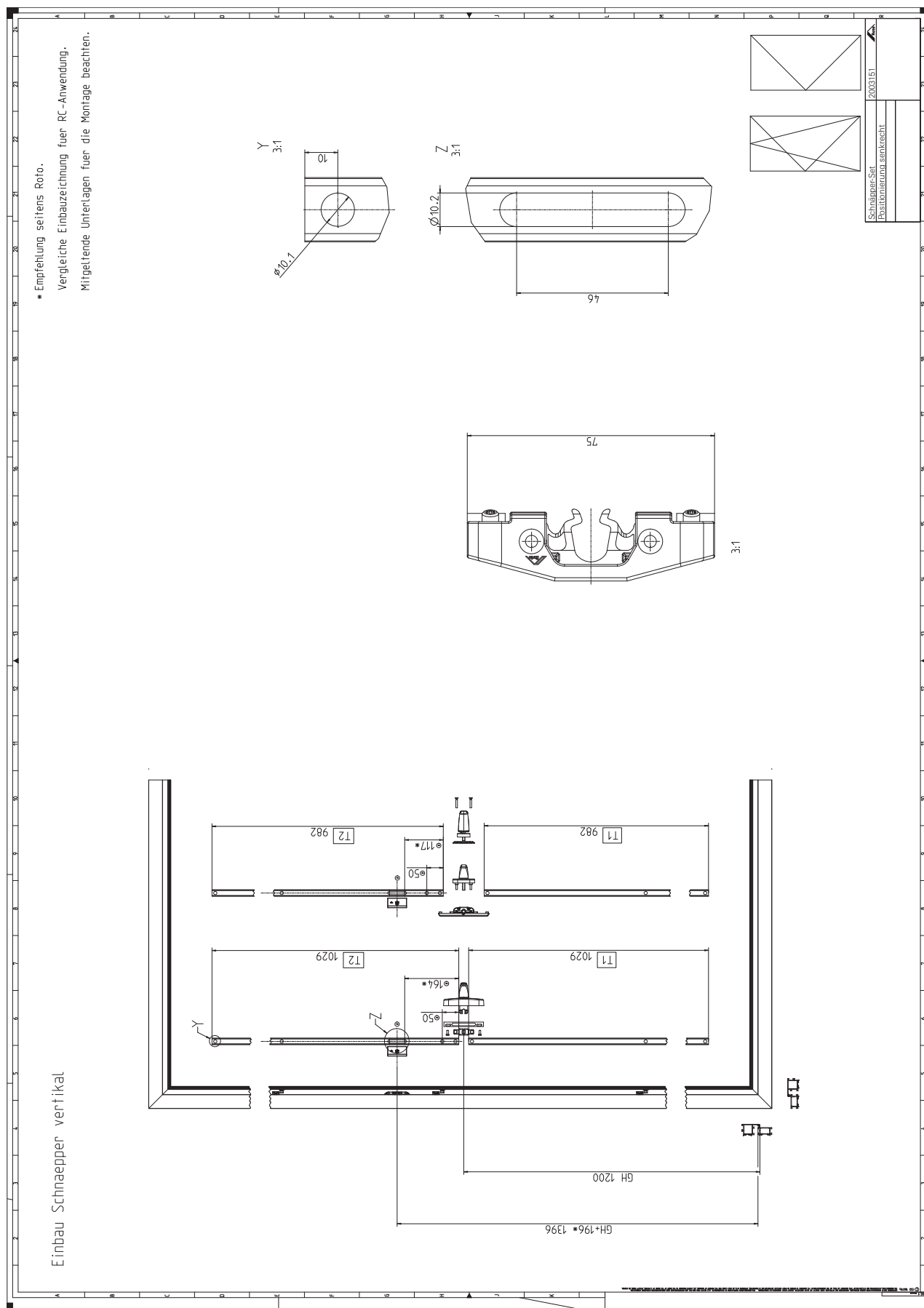
Marking	Translation
Empfehlungen seitens Roto	Recommendations from Roto
Einbau Schnaepper horizontal	Horizontal installation of bullet-catch set
Einbau Schnaepper vertikal	Vertical installation of bullet-catch set
Einbau Schnaepper, Zapfen und Treibstange vertikal	Vertical installation of bullet catch, bullet-catch cam, and connecting rod
Einbau Schnaepper, Zapfen und Unterlage horizontal	Horizontal installation of bullet catch, bullet-catch cam and packer
Einbau Schnaepper, Zapfen, Unterlage und Treibstange horizontal	Horizontal installation of bullet catch, bullet-catch cam, packer and connecting rod
Einbauoptionen	Installation options
Einbauoptionen Schnaepper	Installation options for the bullet-catch set
FB2	Sash width of second opening sash
GH	Handle height
In Kombination mit Auflauf, Unterlage fuer Schnaepperzapfen nicht verwenden.	Do not use the packer for the bullet-catch cam in conjunction with the run-up block.
Mitgeltende Unterlagen fuer die Montage beachten.	Comply with the other applicable documents for installation.
Profilueberpruefung beachten	Pay attention to the profile assessment.
Positionierung senkrecht	Vertical positioning
Positionierung waagrecht	Horizontal positioning
Rastkraftreduzierung: Zur Verringerung der Rastkraefte, koennen die Zusatzstuetzen der Rastfeder abgetrennt werden.	Supplementary documents: installation drawings of floating mullion
Schnäpper-Set	Bullet-catch set
Vergleiche Einbauzeichnung fuer RC-Anwendung.	Cf. installation drawing for RC application.
Zur Reduzierung der Rastkraefte, Zusatzstuetzen an den gestrichelten Linien abtrennen.	To reduce the latching forces, detach the additional supports at the dashed lines.
Zusatzbefestigung: Gusshaut in der Senkung durchtrennen. Bohrungen mit Bohrer des Durchmessers 3 am Rahmen vorbohren. Schnaepper mit zwei Senk-Blechschauben ST3.5x20 festschrauben.	Additional fastening: pierce the cast skin in the countersunk hole. Predrill holes on the frame with a Ø 3.0 drill. Fasten the bullet catch with two countersunk self-tapping screws ST3.5 x 20.

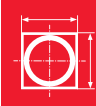
9.7.2 Bullet-catch set

Horizontal installation

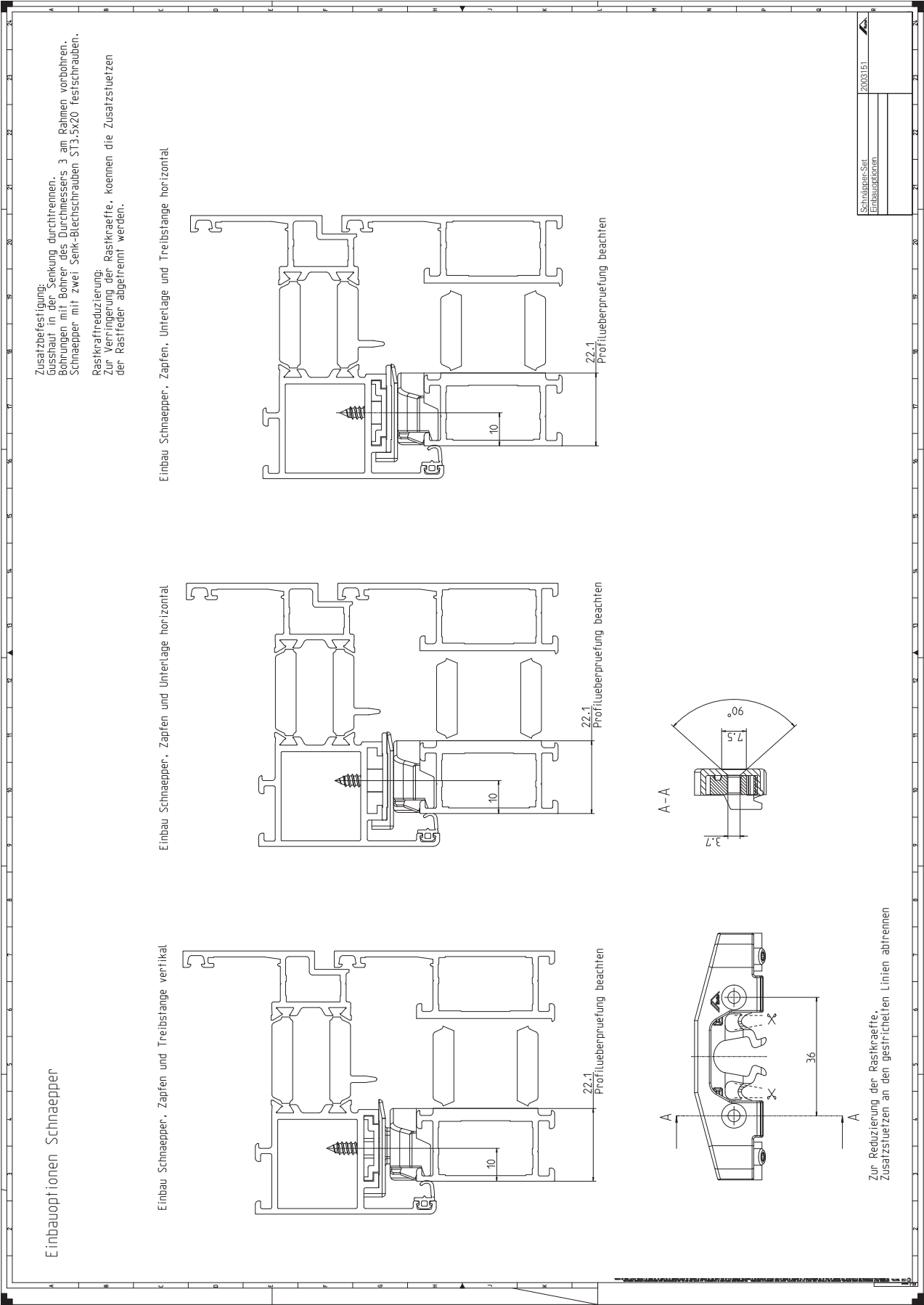


Vertical installation





Cross section of installation options



10 Adjustment



INFO

Roto hardware components may only be adjusted by authorised professionals when the element is installed.

10.1 Gasket compression adjustment

10.1.1 Cam, insertable

Tool: size 4 hex key

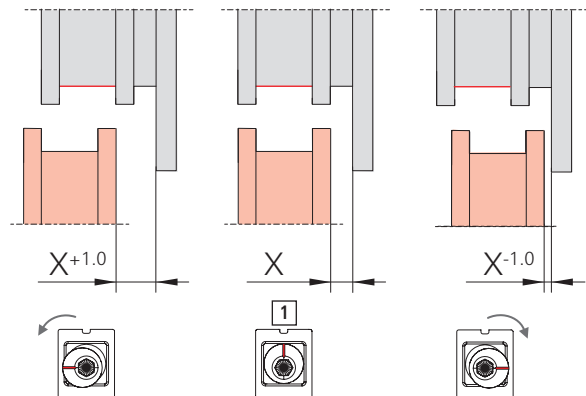
Euro-groove

⇒ On all cams, the recess points in the opposite direction to the direction of travel all the way round → *from page 187*.

When the locking cam is in the neutral position [1], the notch points towards the recess.

1. Turn the cam anticlockwise to reduce the gasket compression. This increases the distance between the sash and frame by 1.0 mm.

Turn the cam clockwise to increase the gasket compression. This reduces the distance between the sash and frame by 1.0 mm.



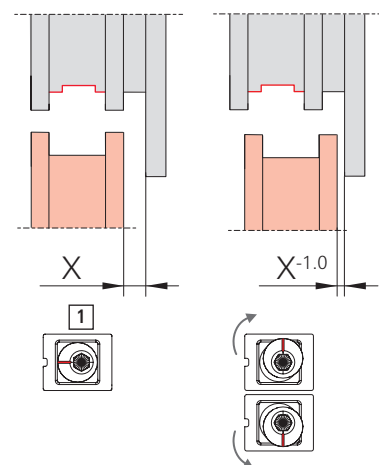
ECC-groove

⇒ On all cams, the recess points away from the sash overlap / towards the sash overlap all the way round → *from page 187*.

When the locking cam is in the neutral position [1], the notch points towards the recess.

1. Increasing the gasket compression

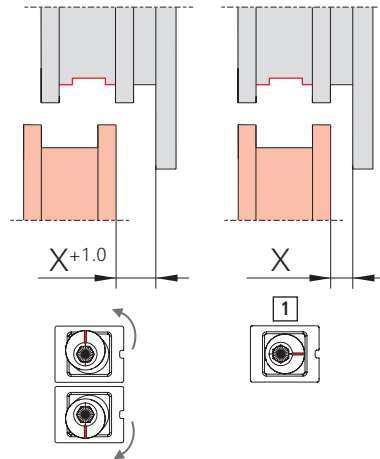
Turn the cam to increase the gasket compression. This reduces the distance between the sash and frame by 1.0 mm.





2. Reducing the gasket compression

Turn the cam to reduce the gasket compression.
This increases the distance between the sash and frame by 1.0 mm.



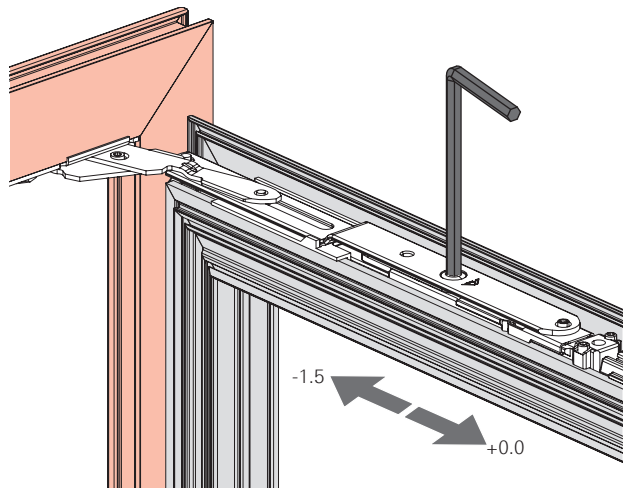
10.2 Tilt&Turn hardware

10.2.1 Lateral adjustment

10.2.1.1 Sash stay 390

Adjusting the sash stay

1. Open the sash.
2. Lateral adjustment -1.5 mm.
Tool: size 4 hex key



10.2.1.2 Sash stay 500, 735



DANGER

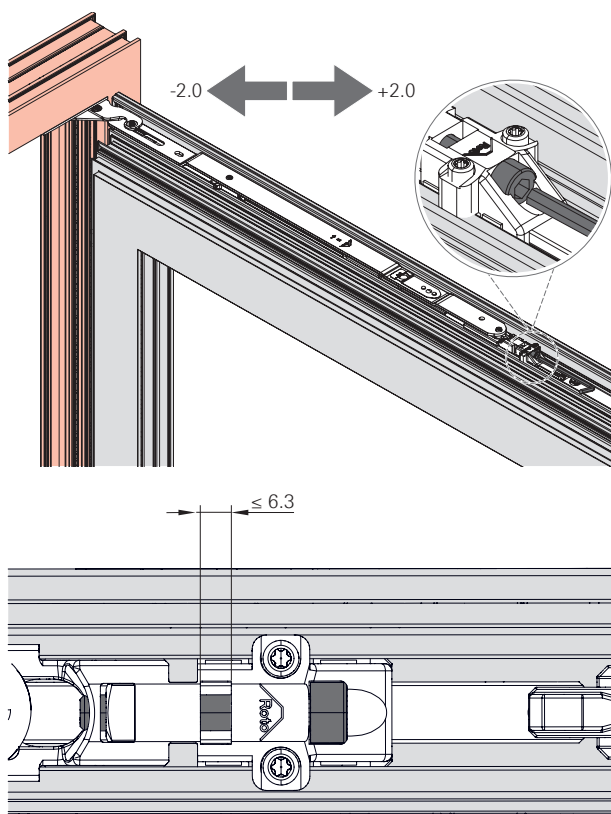
Risk of death caused by incorrect adjustment!

Unscrewing the screw too far may lead to hazardous situations and cause serious or fatal accidents.

- Roto hardware components may only be adjusted by authorised professionals.
- The gap must be smaller than 6.3 mm.

1. Open the sash.

2. Lateral adjustment ± 2 mm.
 Tool: size 4 hex key



10.2.1.3 Corner hinge

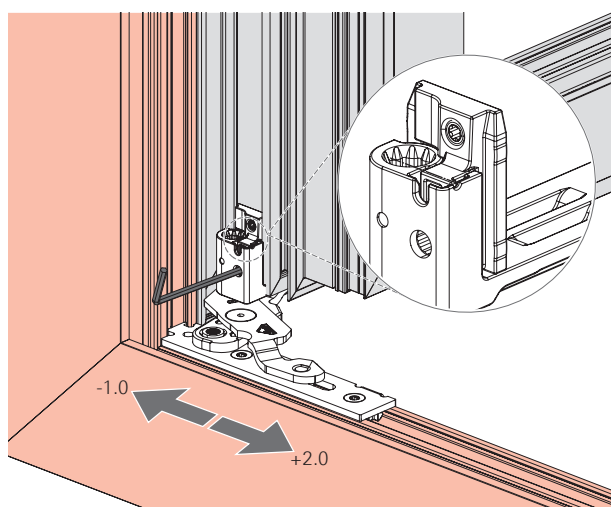


INFO

The 180 kg adjustment piece does not feature lateral adjustment.

Adjusting the corner hinge

1. Open the sash.
2. Lateral adjustment -1 mm / +2 mm.
 Tool: size 4 hex key



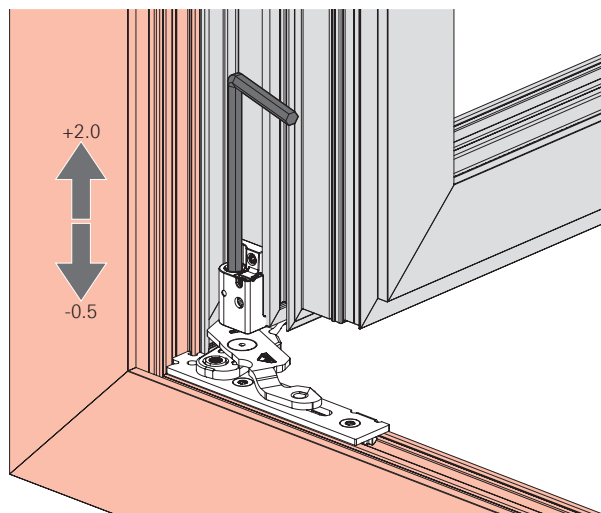


10.2.2 Height adjustment

10.2.2.1 Corner hinge

Adjusting the corner hinge

1. Open the sash.
2. Height adjustment +2 mm / -0.5 mm via screw in the corner hinge.
Tool: size 4 hex key



10.3 TiltFirst hardware

10.3.1 Lateral adjustment

10.3.1.1 Sash stay 500, 735



DANGER

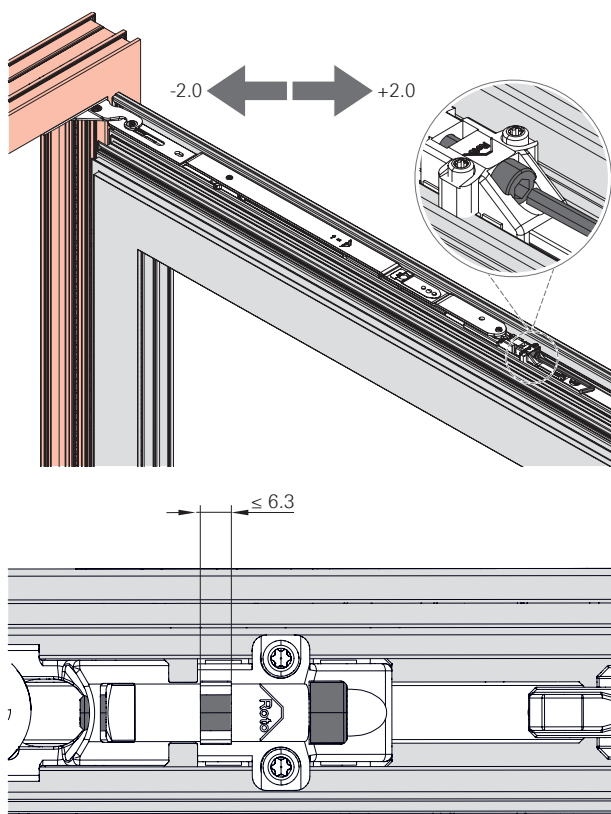
Risk of death caused by incorrect adjustment!

Unscrewing the screw too far may lead to hazardous situations and cause serious or fatal accidents.

- ▶ Roto hardware components may only be adjusted by authorised professionals.
- ▶ The gap must be smaller than 6.3 mm.

1. Open the sash.

2. Lateral adjustment ± 2 mm.
Tool: size 4 hex key



10.3.1.2 Corner hinge

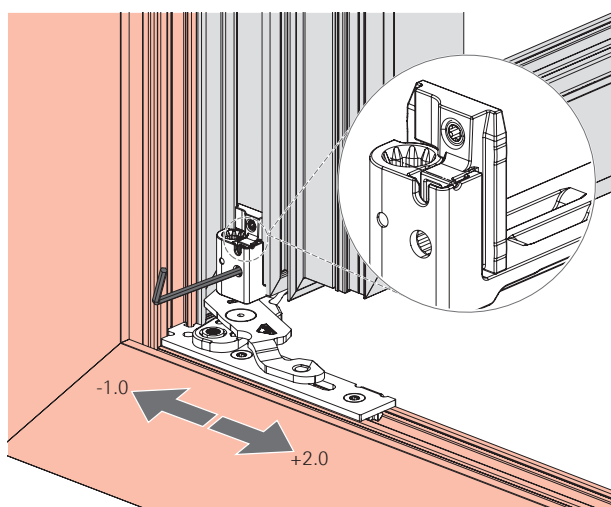


INFO

The 180 kg adjustment piece does not feature lateral adjustment.

Adjusting the corner hinge

1. Open the sash.
2. Lateral adjustment -1 mm / +2 mm.
Tool: size 4 hex key



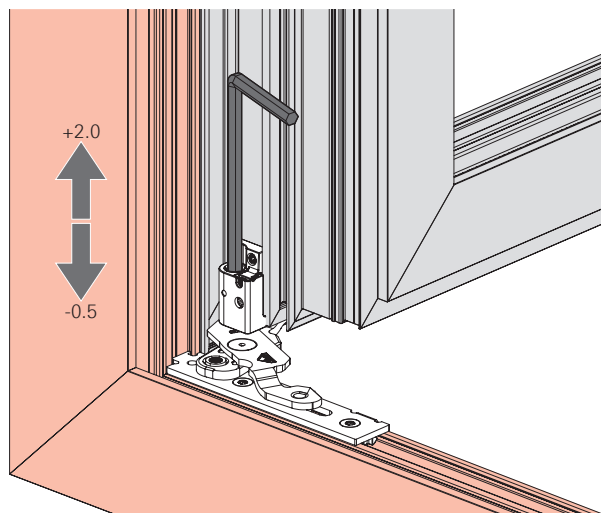


10.3.2 Height adjustment

10.3.2.1 Corner hinge

Adjusting the corner hinge

1. Open the sash.
2. Height adjustment +2 mm / -0.5 mm via screw in the corner hinge.
Tool: size 4 hex key



10.4 Turn-Only hardware

10.4.1 Lateral adjustment

10.4.1.1 Corner hinge

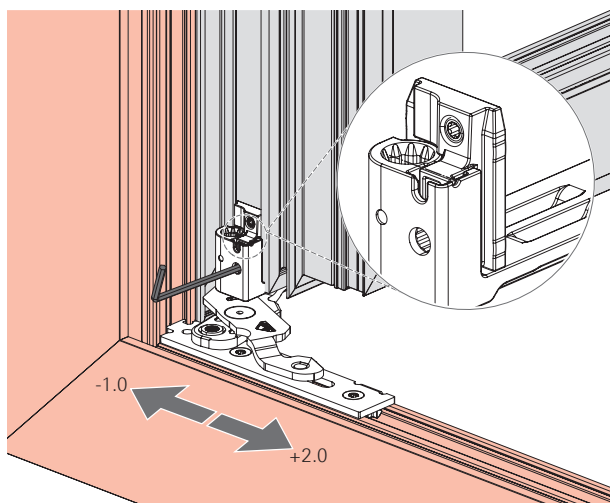


INFO

The 180 kg adjustment piece does not feature lateral adjustment.

Adjusting the corner hinge

1. Open the sash.
2. Lateral adjustment -1 mm / +2 mm.
Tool: size 4 hex key



- When using the CL set, ensure a collision-free closing process between the CL frame component and CL sash component.

10.4.1.2 Rebate stay hinge, couplable, and rebate stay hinge



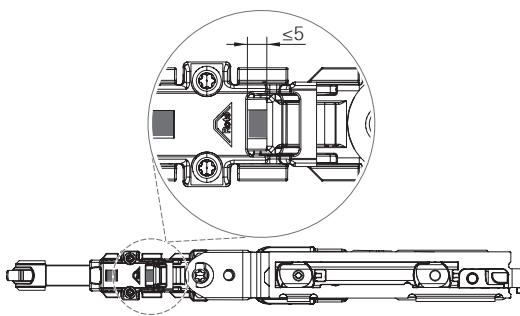
DANGER

Risk of death caused by incorrect adjustment!

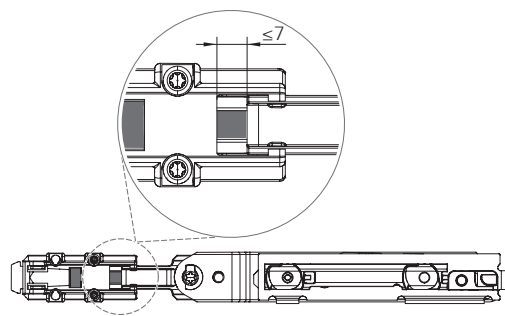
Unscrewing the screw too far may lead to hazardous situations and cause serious or fatal accidents.

- ▶ Roto hardware components may only be adjusted by authorised professionals.
- ▶ Rebate stay hinge, couplable: gap ≤ 5.0 mm
- ▶ Rebate stay hinge: gap ≤ 7.0 mm

Rebate stay hinge, couplable



Rebate stay hinge



Adjusting the rebate stay hinge, couplable / rebate stay hinge

- Open the sash.
- Lateral adjustment ± 2 mm.
Tool: size 4 hex key

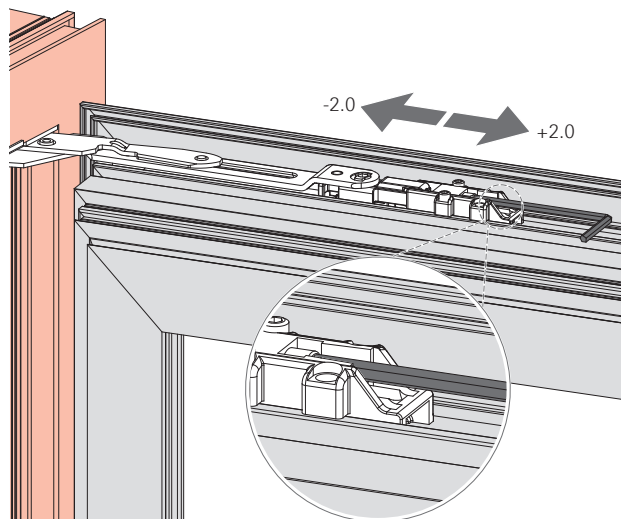


Fig. 10.1: Rebate stay hinge

- When using the CL set, ensure a collision-free closing process between the CL frame component and CL sash component.



10.4.1.3 Sash stay 735



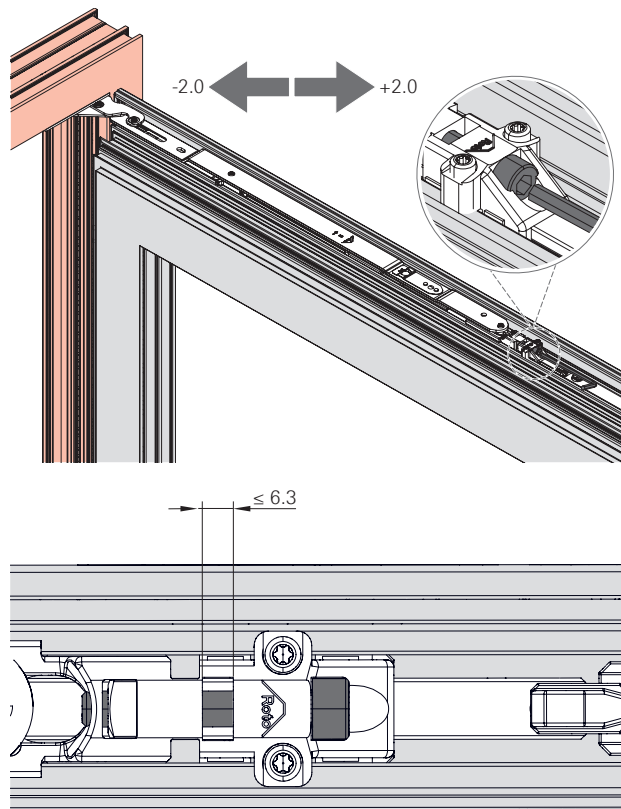
DANGER

Risk of death caused by incorrect adjustment!

Unscrewing the screw too far may lead to hazardous situations and cause serious or fatal accidents.

- ▶ Roto hardware components may only be adjusted by authorised professionals.
- ▶ The gap must be smaller than 6.3 mm.

1. Open the sash.
2. Lateral adjustment ± 2 mm.
Tool: size 4 hex key



10.4.2 Height adjustment

10.4.2.1 Corner hinge

Adjusting the corner hinge

1. Open the sash.

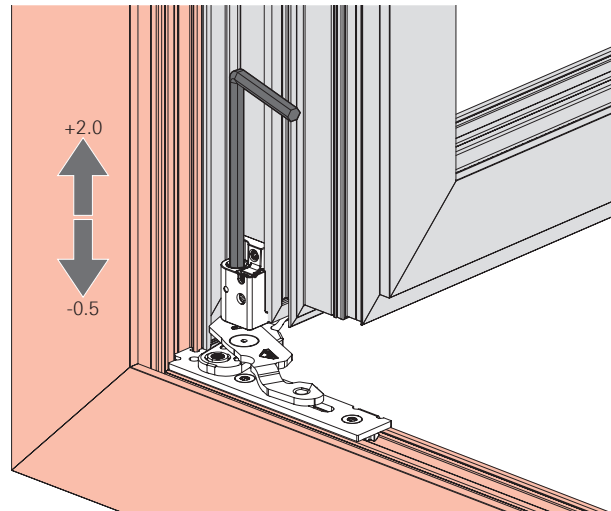
Adjustment

Turn-Only hardware

Gasket compression adjustment

2. Height adjustment +2 mm / -0.5 mm via screw in the corner hinge.

Tool: size 4 hex key



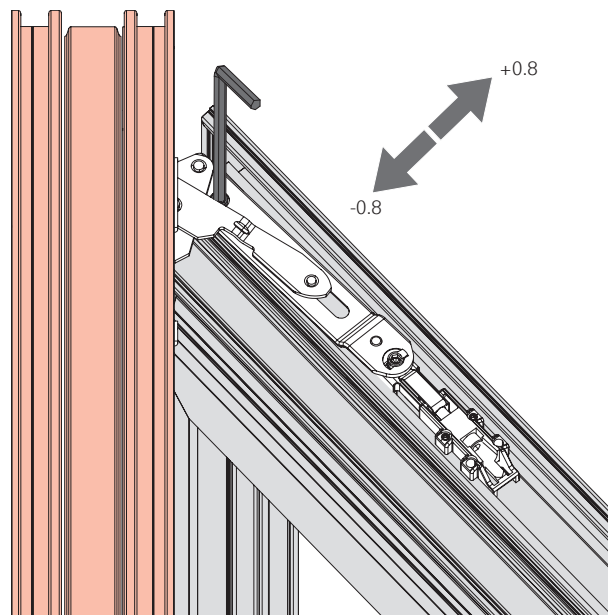
10.4.3 Gasket compression adjustment

10.4.3.1 Rebate stay hinge | 150 kg

Adjusting the rebate stay hinge

1. Open the sash.
2. Gasket compression adjustment ± 0.8 mm.

Tool: size 4 hex key



10.4.3.2 CL frame component

Adjusting the CL frame component

1. Open the sash.

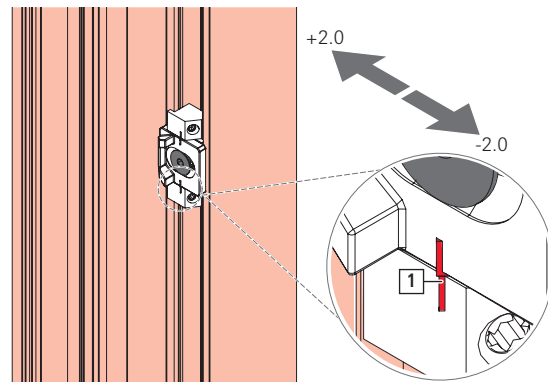


2. [1] Neutral position

Undo the central screw. Move the adjustment plate and tighten the screw.

Gasket compression adjustment ± 2 mm.

Tool: size 2.5 hex key



11 Operation

11.1 Operating information

The windows and balcony doors are operated using a handle.

The following symbols illustrate the different handle positions and the resultant sash positions of the windows and balcony doors.

11.1.1 Handle position with Tilt&Turn hardware

Handle position	Sash position	Meaning
		Sash in closed position.
		Sash in turned, open position.
		Sash in night ventilation position.
		Sash in tilted, open position.

Security striker for tilt ventilation (TiltSafe)

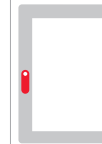
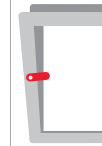


INFO

RC 2 protection cannot be achieved in the 135° handle position (night ventilation). To achieve RC 2 protection:

1. Tilt the window
2. Lock the handle
3. Remove the key.

11.1.2 Handle position with TiltFirst hardware

Handle position	Sash position	Meaning
		Sash in closed position.
		Sash in tilted, open position.



Handle position	Sash position	Meaning
		Sash in turned, open position.

11.1.3 Handle position with Turn-Only hardware

Handle position	Sash position	Meaning
		Sash in closed position.
		Sash in turned, open position.

11.1.4 Handle position with Tilt-Only hardware

Handle position	Sash position	Meaning
TiSt		
		Sash in closed position.
		Sash in tilted, open position.
TiSs		
		Sash in closed position.
		Sash in tilted, open position.

11.1.5 Incorrect position

Handle position	Sash position	Meaning
		Sash in incorrect position.

11.2 Fault assistance

Fault	Cause	Corrective action	To be carried out by
Handle is difficult to turn.	Frame components have not been greased.	Grease the frame components.	□
	Handle is damaged.	Replace the handle.	■
	Handle screwed into place too tightly.	Undo the screw fixing slightly.	■
	Sash components with slanting screws.	Screw the sash components in straight.	■
	Sash components are damaged.	Replace the sash components.	■
	Incorrect striker positions.	Adapt the striker positions.	■
	Sash stay gasket compression is too strong (build-up on gasket).	Adjust the sash stay gasket compression or clean the gasket.	■
Handle cannot be turned 180°.	Sash components hinged or installed incorrectly.	Check the setting in the turn position (potentially rehang – start from the T&T espagnolette).	■
	Connecting rod dimensions not OK.	Check the connecting rod dimensions.	■
Sash falls into the tilt position when in the turn position.	Excessive clearance at the top.	Check the fit of the corner hinge.	■
		Check the fit of the pivot rest.	■
		Adjust the corner hinge so that it is positioned higher (pay attention to the tilt striker).	■
Sash falls into the turn position when in the tilt position.	Tilt striker damaged.	Replace the tilt striker.	■
	Scissor stay inclusion not OK due to incorrect connecting rod dimensions.	Check the connecting rod dimensions.	■
Sash scrapes in the tilt position.	Insufficient clearance at the top.	Lower the corner hinge (pay attention to the tilt striker).	■
Sash moves into incorrect position.	Sash has been operated incorrectly.	<div>  INFO Only turn the handle to the tilted, open position when the sash is fully closed. Push tall sashes shut with force above the handle before operating the handle. Do not open the sash any further. </div> <ol style="list-style-type: none"> Carefully move the sash back to the approximate initial position. Move the handle to the turned, open position. Operate the mishandling device if necessary. Push the sash shut at the bottom. Move the handle to the tilted, open position. Operate the mishandling device if necessary. Close the window and push the sash shut below the handle. Move the handle to the closed position. 	□
Locking cam is rubbing against the striker.	Sash mounted incorrectly.	Rehang the sash.	■
	Incorrect striker position.	Adapt the striker position.	■

□ = May be carried out by a specialist company or the end user

■ = **Must** be carried out by a specialist company



12 Maintenance



CAUTION

Performing maintenance work incorrectly can lead to injuries.

Performing maintenance incorrectly can lead to injuries.

- ▶ Ensure that there is sufficient space for installation before starting work.
- ▶ Ensure that the installation site is clean and tidy.
- ▶ Always have hardware adjustment and replacement work performed by a specialist company.
- ▶ Secure the sash against unintentionally opening or closing.
- ▶ Do not unhinge the sash for maintenance.



ATTENTION

Incorrect or improper testing may cause property damage.

Incorrect or improper testing of the hardware may cause the element to malfunction.

- ▶ Have the hardware checked by a specialist company when installed.
- ▶ If defects need to be remedied, have the element unhinged and remounted by a specialist company.



INFO

The manufacturer must draw the attention of builders and end consumers to these maintenance instructions.

Roto Frank Fenster- und Türtechnologie GmbH recommends the manufacturer conclude a maintenance agreement with their end users.

No legal claims can be derived from the following recommendations; their application is to be based on the specific individual case.

	Responsibility	
Maintenance interval	☐	→ from page 309
Cleaning		→ from page 310
Clean hardware	☐	
Care		→ from page 310
Lubricate movable parts	☐	
Lubricate locking points	☐	
Performance test		→ from page 311
Check that hardware components are fitted securely	☐	
Inspect hardware components for wear	☐	
Check that movable parts work properly	☐	
Check that locking points work properly	☐	
Check ease of movement	■	
Repair		→ from page 312
Retighten screws	■	
Replace damaged components	■	

☐ = May be carried out by a specialist company or the end user

■ = **Must** be carried out by a specialist company

12.1 Maintenance intervals



ATTENTION

Failure to adhere to maintenance intervals may cause property damage.

The maintenance interval for all tasks relating to the hardware components is **annually** at the least. In hospitals, schools and hotels, the maintenance interval is **six-monthly**.

Regular maintenance is necessary in order to maintain the proper and smooth-running operation of the hardware and to prevent premature wear or even defects.

- ▶ Determine and adhere to the appropriate maintenance interval in accordance with the ambient conditions.

12.2 Cleaning



ATTENTION

Using incorrect cleaning agents and sealing compounds may cause property damage.

Cleaning agents and sealing compounds may damage the surfaces of components and gaskets.

- ▶ Do not use aggressive or flammable liquids, acidic cleaners or abrasive cleaners.
- ▶ Only use mild, pH-neutral cleaning agents that have been diluted.
- ▶ Apply a thin protective film to the components, for example using a cloth soaked in oil.
- ▶ Avoid aggressive vapours (e.g. produced by formic acid, acetic acid, ammonia, amine compounds, ammonia compounds, aldehyde, carbolic acid, chlorine, tannic acid) around the element.
- ▶ Do not use any acetic acid-crosslinking or acid-crosslinking sealing compounds or those with the aforementioned constituents as both direct contact with the sealing compound and its fumes can corrode the surface of the components.

Cleaning the hardware

- ▶ Clean deposits and contaminants off the hardware using a soft cloth.
- ▶ Lubricate movable parts and locking points after cleaning. → 12.3 "Care" from page 310
- ▶ Apply a thin protective film to the hardware, for example using a cloth soaked in oil.

12.3 Care



ATTENTION

Using incorrect lubricants may cause property damage.

Substandard lubricants can prevent the hardware from working properly.

- ▶ Use high-quality lubricants.
- ▶ Only use resin-free and acid-free lubricants.
- ▶ Use appropriate lubricant in more challenging climatic conditions. Note the manufacturer specifications.



ATTENTION

Cleaning agents and lubricants may pollute the environment.

Leaking or excess cleaning agents and lubricants may pollute the environment.

- ▶ Remove any leaking or excess cleaning agents and lubricants.
- ▶ Dispose of cleaning agents and lubricants separately and properly.
- ▶ Observe the applicable directives and national laws.

Ease of movement can be improved by lubricating or adjusting the hardware. All functional hardware components must be lubricated on a regular basis.

Recommended lubricants

- Roto NX / NT grease
Material number: 782881

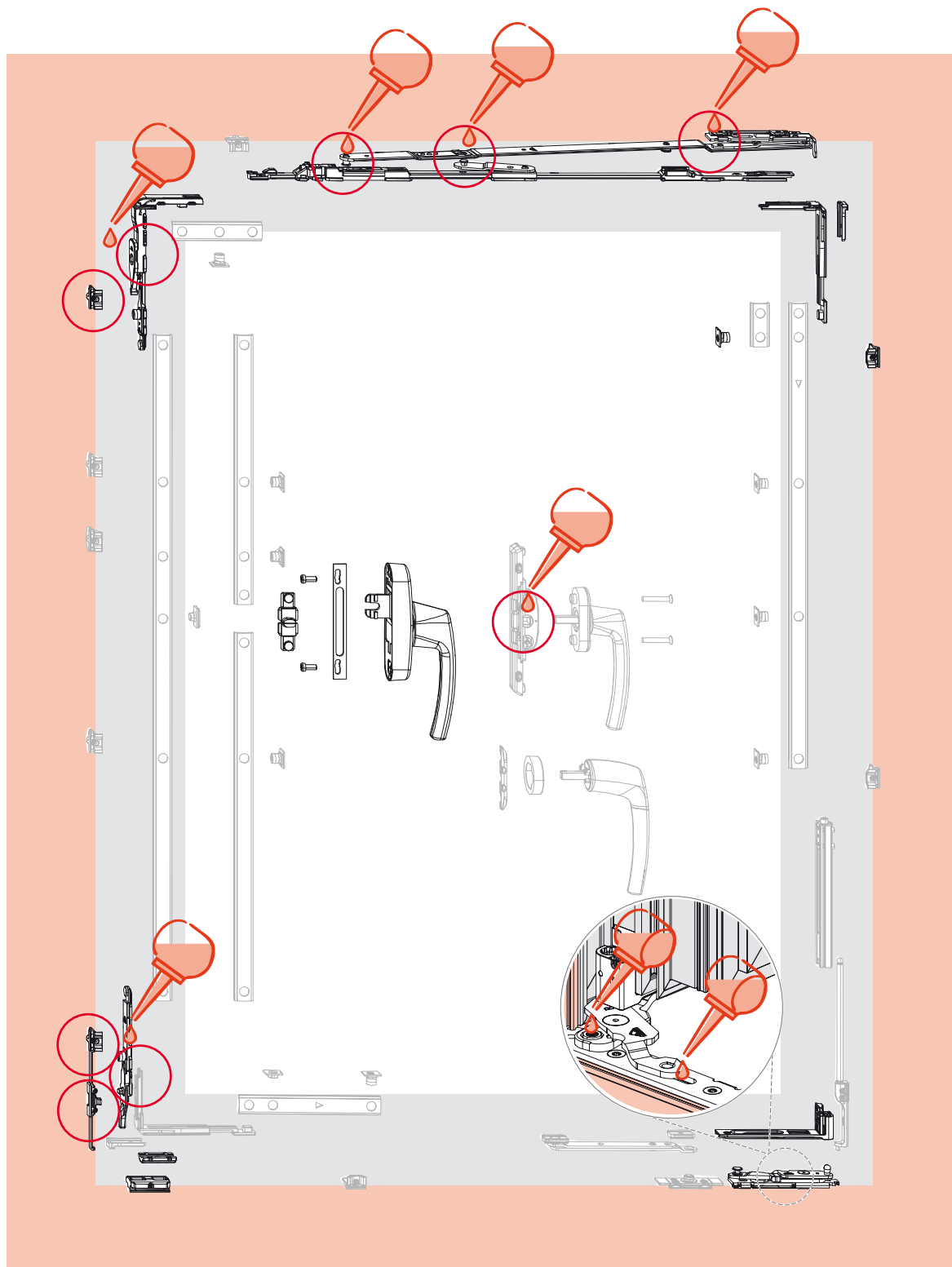


INFO

The figure displays the positioning of potential lubrication points. The figure does not necessarily match the installed hardware. The quantity of lubrication points varies depending on the size and design of the element.



12.3.1 Roto AL Designo



12.4 Performance test

Check for proper operation:

- ▶ Inspect hardware components for damage, deformation and a secure fit.
- ▶ Check that windows or balcony doors run smoothly by opening and closing them.
- ▶ Check the window or balcony door gaskets for elasticity and fit.
- ▶ Check closed windows or balcony doors to ensure that they are tight.

- ▶ Locking and unlocking torque max. 10 Nm. The test can be performed using a torque wrench.

Have malfunctions remedied by a specialist company.

12.5 Repair



WARNING

Improper repair work may pose a risk of death!

Improper maintenance may prevent the element from working properly and make it less safe to use.

- ▶ Always have repairs performed by a specialist company.



ATTENTION

Improper screw fixings may cause property damage.

Loose or faulty screws can prevent the hardware from working properly.

- ▶ Check that the individual screws are secure and seated correctly.
- ▶ Tighten or replace loose or faulty screws.
- ▶ Use only the suggested screws.

Repair work includes replacing and repairing components and is only necessary if components have become damaged after wear or as a result of external circumstances. The hardware must be secured reliably in order to ensure that the element works properly and is safe to use.

The following tasks must only be performed by a specialist company:

- All adjustment work on the hardware,
- Replacing hardware or hardware components,
- Installing and removing windows, doors or balcony doors

The specialist company must observe the following:

- Perform the necessary repair work properly, according to generally recognised engineering practice and in accordance with the applicable regulations.
- Do not perform makeshift repairs on worn or damaged components.
- Only use original or approved spare parts for repairs.



13 Dismantling



WARNING

Improper dismantling may pose a risk of death!

The sash may fall during dismantling.

- ▶ Secure the sash to prevent it from falling, e.g. by using two people.
- ▶ Always have dismantling work performed by a specialist company.



CAUTION

Physical strain may cause injury and damage to health.

Carrying and lifting heavy loads for extended periods leads to physical injury in the long term.

- ▶ When carrying or lifting loads, maintain an ergonomically correct posture. The maximum permissible load is 25 kg for men and 10 kg for women.



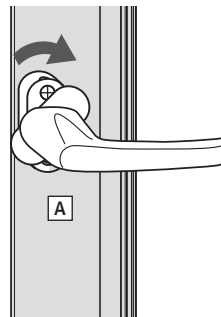
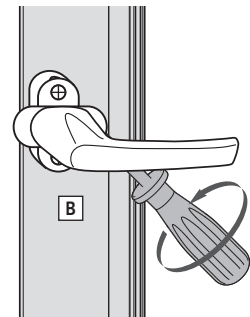
INFO

Unless otherwise stated, dismantling is performed in reverse order to installation.

13.1 Handle

Removing the handle

1. Move the handle to the turn position (to the tilt position for TF).
2. Lift the escutcheon cover and turn it 90° [A].
Undo the screws [B].
Tool: Phillips screwdriver PH2



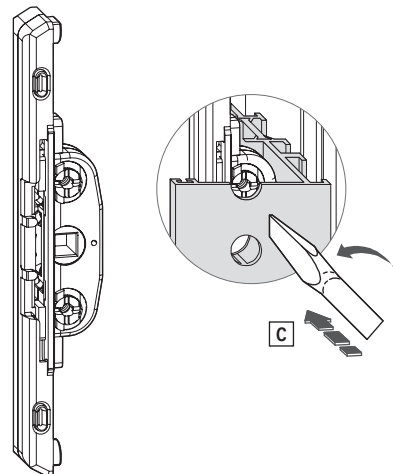
3. Remove the handle.

13.2 Flush-encased gearbox

Removing the flush-encased gearbox

1. Push the engaged clampable lugs towards the espagnolette and turn anticlockwise [C].

Tool: flat-tip screwdriver 8 x 1.2 mm



2. Remove the flush-encased gearbox by pulling it to the side.

13.3 Load transfer

Removing the load transfer

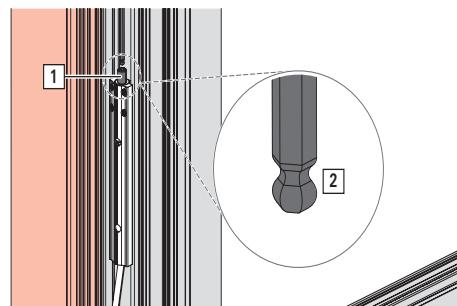
1. Use the adjusting screw [1] to fully release the load transfer spring.

Tool: hex key (with ball-shaped head [2]) 4 mm



INFO

If the spring is not fully released, the sash cannot be rehinged.



13.4 Sash stay 500

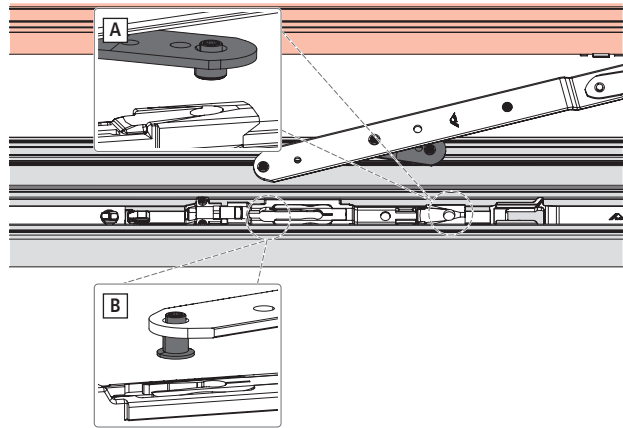
1. Move the handle to the turn position.
2. Open the sash slightly (by approx. 10°).
3. Push down on the mishandling device on the corner drive or flush-encased gearbox.
Move the handle to the tilt position.

Under normal circumstances, this constitutes incorrect operation of the hardware, but it is a necessary step in this case.
4. With the sash slightly tilted, hold it in position.

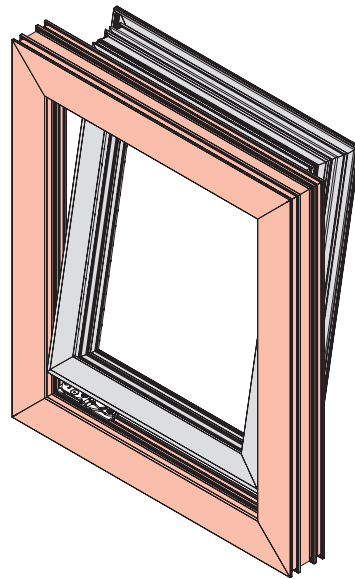


5. Unhinge the sash stay in the scissor stay guide, ensuring that you use the following unhinging points:
 - [A] Push the stay arm link up until the bolt is exposed.
 - [B] Push the sash towards the hinge side until the mounting bolt slides out of the scissor stay guide.

Close the sash stay.



6. Tilt the sash and lift it out of the pivot rest.

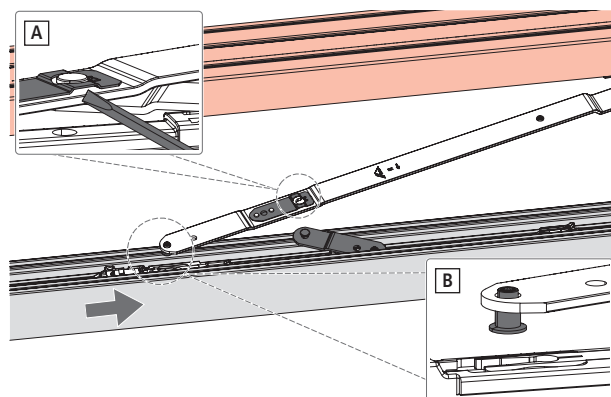


13.5 Sash stay 735

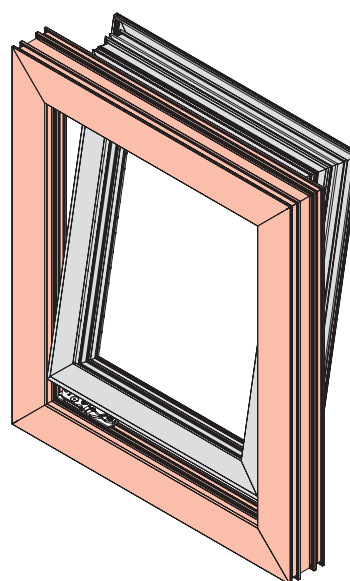
1. Move the handle to the turn position.
2. Open the sash slightly (by approx. 10°).
3. Push down on the mishandling device on the corner drive or flush-encased gearbox.
Move the handle to the tilt position.

Under normal circumstances, this constitutes incorrect operation of the hardware, but it is a necessary step in this case.
4. With the sash slightly tilted, hold it in position.

5. Unhinge the sash stay in the scissor stay guide, ensuring that you use the following unhinging points:
 - [A] Lift the retaining spring on the stay arm using a screwdriver.
 - [B] Push the sash towards the hinge side until the mounting bolt slides out of the scissor stay guide.
- Close the sash stay.



6. Tilt the sash and lift it out of the pivot rest.

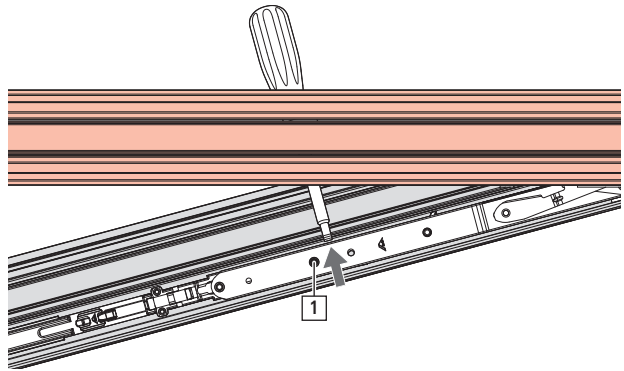


13.6 FM – second opening sash

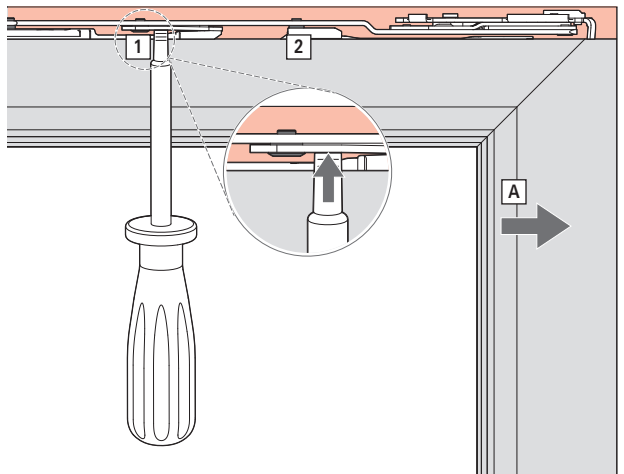
1. Open the active floating-mullion sash and prevent it from swinging closed unintentionally.
2. Move the FM espagnolette handle to the turn position.
3. Open the passive floating-mullion sash approximately 30° – 50°.
4. Move the FM espagnolette handle to the locked position.
5. Secure the floating-mullion sash to prevent it from falling.



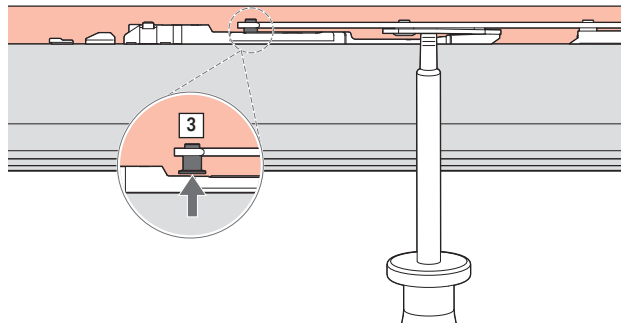
6. Slide the flat side of a screwdriver blade (blade min. 8 mm) under the stay arm next to the cam [1].



7. Turn the screwdriver blade to lever the cams [1] and [2] out of their inclusions.
Push the sash towards the hinge side [A].

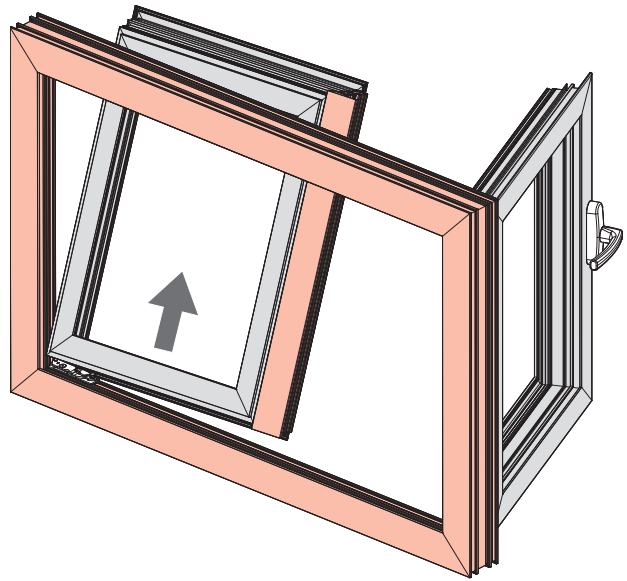


8. Lever the cam [3] out of its inclusion.



9. Close the passive floating-mullion sash.
Before doing so, move the FM espagnolette handle to the turn position.

10. Tilt the passive floating-mullion sash and carefully guide it upwards out of the frame.





14 Transport

14.1 Transporting elements and hardware



DANGER

Improper transport poses a risk of death!

Improper procedures for transporting, loading or unloading elements may cause serious injuries and glass breakage as a result of the elements swinging open, falling or becoming overloaded.

- ▶ Note the applicable accident prevention regulations.
- ▶ Note force application points and reaction forces.
- ▶ Prevent the sash from opening uncontrollably.
- ▶ Avoid jerky movements.
- ▶ Use suitable transportation means and protective devices.
- ▶ Watch out for protruding components.
- ▶ Transport heavy loads with two people and use suitable transportation means (such as an industrial truck).



CAUTION

Trapped limbs may result in injuries.

The transported goods can skid, open, close or fall during transport. This can result in limbs being trapped and seriously injured.

- ▶ Never reach near the scissor stays.
- ▶ Close the sash after installation and secure it in place for transport.
- ▶ Wear safety gloves and protective footwear.



CAUTION

Physical strain may cause injury and damage to health.

Carrying and lifting heavy loads for extended periods leads to physical injury in the long term.

- ▶ When carrying or lifting loads, maintain an ergonomically correct posture. The maximum permissible load is 25 kg for men and 10 kg for women.

Hardware is supplied to the specialist company as complete sets. The components are packaged accordingly for each scope of delivery. The instructions for safely transporting the hardware are described below.

Observe the following basic instructions when transporting hardware:

- ▶ Transport larger scopes of delivery using appropriate transportation means (such as industrial trucks).
- ▶ Note the transport weight in order to select appropriate transportation means.
- ▶ Ensure that the transport process is careful and appropriate for the material and that components are protected against dirt during transport.
- ▶ Immediately check the delivery for completeness and transport damage on receipt.



INFO

Submit a complaint about any defects as soon as they are identified. Claims for damages may only be made within the reclamation period.

Use the following transportation means for support when transporting, loading and unloading larger scopes of delivery:

- Industrial trucks, e.g. forklifts, telescopic handlers, pallet trucks

- Lifting equipment, e.g. transport nets, carry straps, round slings
- Protective devices, e.g. edge protection, spacer blocks



INFO

Industrial trucks and lifting devices may only be operated by qualified persons.



INFO

Lifting equipment and protective devices may only be used if they are in full working order.

14.2 Storing the hardware

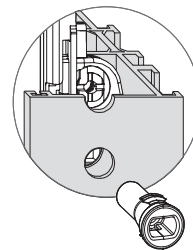
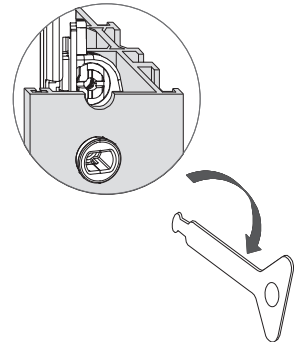
Store all hardware components as follows until they are installed:

- Dry and protected
- On a level surface
- Protected against sunlight

14.3 Transport safety device

Transport safety device for flush-encased gear-boxes with a handle without escutcheon.

Insert the transport safety device (included in the handle set) in the square hole after the flush-encased gearbox has been installed. Remove the transport safety device with the pull key (see CTL_1) before installing the handle.





15 Disposal



ATTENTION

Incorrect disposal may pollute the environment.

Pieces of hardware are raw materials.

- ▶ Dispose of hardware for environmentally friendly material re-utilisation as mixed scrap.

15.1 Disposing of packaging

The hardware is supplied as complete sets together with the packaging. Once unpacked, the installation company or builder is responsible for disposing of the packaging properly. The packaging materials are produced in accordance with current environmental protection standards. The materials can be recycled separately.

Follow the basic instructions below for the proper disposal of packaging:

- ▶ Do not dispose of packaging in household waste.
- ▶ Hand over packaging at local waste collection points or recycling centres.
- ▶ Observe the national regulations on the disposal of recyclable materials.
- ▶ Contact the local authorities if necessary.

15.2 Disposing of hardware

Once the hardware is finished with, the end user or builder is responsible for properly disposing of the windows, doors or balcony doors and the hardware, including any accessories. Hardware is produced in accordance with current environmental protection standards. The materials can be recycled separately.

Follow the basic instructions below for the proper disposal of hardware:

- ▶ Observe the information and specifications for disposal contained in the other applicable documents.
- ▶ Separate hardware components from windows, doors or balcony doors.
- ▶ Do not dispose of hardware in household waste.
- ▶ Hand over hardware at local waste collection points or recycling centres.
- ▶ Observe the national regulations on the disposal of recyclable materials.
- ▶ Contact the local authorities if necessary.



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